MD TEST REPORT

Applicant:	Nemo Power Tools(Huizhou) Co., Ltd.
Address:	2/F, 4th Industrial Area, Luokeng Village, Xiaotie Zone, Xiaojinkou Town, Huicheng District, Huizhou City, Guangdong Province, China
Manufacturer:	Nemo Power Tools(Huizhou) Co., Ltd.
Address:	2/F, 4th Industrial Area, Luokeng Village, Xiaotie Zone, Xiaojinkou Town, Huicheng District, Huizhou City, Guangdong Province, China
EUT:	OTTOVAC
Brand Name:	GRABO
Model Number:	OTTOVAC-V1(OV-V1)
Date of Receipt:	Dec. 30, 2021
Test Date:	Dec. 30, 2021 - Jan. 05, 2022
Date of Report:	Jan. 05, 2022
Prepared By:	Shenzhen DL Testing Technology Co., Ltd.
Address:	101-201, Building C, Shuanghuan, No.8, Baoqing Road, Baolong Industrial Zone, Baolong Street Longgang District, Shenzhen, Guangdong, China
Applicable Standards:	2006/42/EC Machinery Directive 2014/35/EU Low Voltage Directive
Test Result:	Pass
Report Number:	DL-20220105020S

Prepared by(Engineer): Kelly Tang

Approved(Manager): Jade Yang

This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Shenzhen DL Testing Technology Co., Ltd.

Version

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Content

Part Ⅰ: General

1.1 General description

This series Motor suite does not belong to the machinery listed in Annex IV of 2006/42/EC, the machinery safety directive.

Basically, this kind of machine belong to normal machine and with low risk when using it. All possible risk have been analysis in the assessment report and been prevent by suitable ways.

The main risk of this series Motor suite could be:
-The risk of electricity shock on touching all electriferous components.
- The risk of access to the drive transmission system

In order to prevent the main risks mentioned above, the protection guarding system is provided, and all detail safety provision are constructed in accordance with the requirement of EN13857. In addition to the safety of the machinery mentioned above, the compliance of LVD directive is also an important part of putting CE mark on the machine. As for the compliance of LVD the inspection and test report carried out according to the European standard of EN 60204-1 was provide too.

In order to ensure the conformity for CE making for these machines, some main European and/or International standards have been used to made assessment of conformity, they are:
-EN60204-1 for checking of electrical equipment;
-EN ISO 12100:2010 for checking of safety of machinery for the **OTTOVAC** The test reports for these applicable standards in detail have been included in the relevant sub-clauses of this technical construction file.

1.2 Variations of the series products

This series of machine have the same function, the technics and same structure. Only the dimensions, capacities and the technical specifications change in some extent.

1.3 Quality control system

In order to ensure the conformity of the series production, the Manufacturer has taken the related procedures mentioned below:

(1) Apply for the consultant form the qualified body in china

The Manufacturer has applied for the consultant form Shenzhen DL Testing Technology Co., Ltd. who is a competent institute for the CE making consultant and certification in china. The compete technical construction file (TCF) have established before applying for the CE making certificate under the consultant of DL.

(2) Carry out the inspection for parts and components according to the TCF.

Before the assemblies of the series production, the QC engineers of **Nemo Power Tools(Huizhou) Co., Ltd.** have to check and inspect technical specifications and intended function of parts and components to ensure the correct use of them according to the contents of TCF and principle described in the related technical information.

(3) Carry out the inspection&testing for the products before packing the products, the QC engineers of Manufacturer have to do the necessary inspection and testing to ensure the conformity of related requirements. In particular, the testing and inspection of electrical characteristics and outer feature.

(4) Carry out the inspection for the packing

After finishing the necessary inspection and testing for the products, an inspection for the packing has to be done

to ensure the necessary elements being included in this packing
before shipment.

(5) Provision for the change of design
Any change of the products described in this TCF must be checked in detail and written down again in the TCF by the designer of Manufacturer, if the change may effects the related electrical or mechanical characteristics.

(6) Provision for the Quality Assurance
For the Provision of internal control measures to ensures to ensure the conformity of series production of the machines, Manufacturer has built an internal quality control system in accordance with the international standard of ISO-9001.

1.4 Declaration of conformity

EC Declaration of Conformity	CE

The undersigned, representing the following:

Manufacturer's Name: Nemo Power Tools(Huizhou) Co., Ltd.	the authorised representative established within the European Economic Area:
ADD: 2/F, 4th Industrial Area, Luokeng Village, Xiaotie Zone, Xiaojinkou Town, Huicheng District, Huizhou City, Guangdong Province, China	

Here with declare that the following machinery:

Description of machinery
Generic denomination: OTTOVAC
Mode/s: OTTOVAC-V1(OV-V1)

Fulfill the relevant provisions of European Directive 2006/42/EC(MD)and 2014/35/EU(LVD).
The harmonized standards used in order to obtain compliance to 2006/42/EC(MD) and 2014/35/EU (LVD) are the following:
EN ISO 12100:2010-Safety of machinery-General principles for design-risk assessment and risk Reduction
EN ISO 13857:2008-Safety of machinery- Safety distances to prevent hazard zones being reached by upper and lower limbs
EN ISO 13850:2015-Safety of machinery-Emergency stop-Principles for design
EN ISO 14120:2015-Safety of machinery-Guards-General requirements for the design and construction of fixed and movable guards

EN ISO 13849-1:2015-Safety of machinery-Safety-related parts of control systems-part 1:General principles for design
EN ISO 14119:2013-Safety of machinery-interlocking devices associated with guards-principles for design and selection
EN 60204-1: 2018-Safety of machinery-Electrical equipment of machines-part 1: General requirements

Part II : Assessment of conformity

2.1 Essential health and safety requirements

1	Essential health and safety requirements		-
1.1	General remarks		-
1.1.1	Definitions		-
1.1.2	Principles of safety integration		-
a)	Machinery must be to constructed that it is fitted for its function, and can be adjusted and maintained without putting person at risk when these operations are carried out under the conditions foreseen by the manufacturer	These requirements have been complied with.	Pass
	The aim of measures taken must be to eliminate any risk of accident throughout the foreseeable lifetime of the machinery, including the phases of assembly and dismantling, even where risks of accident arise from foreseeable abnormal situations	These requirements have been complied with.	Pass
b)	In selecting the most appropriate methods, the manufacturer must apply the following principles, in the order given;		-
	- eliminate or reduce risks as far as possible	Manufacturer has provided enough safety devices to eliminate or reduce risks.	Pass
	- take the necessary protection measure in relation to risks that can't be eliminated	Safety guards and other devices are used.	Pass
	- inform users of the residual risks due to any shortcomings of the protection measures adopted, indicate whether any particular training is required and specify any need to provide personal protection equipment	Enough warnings are provided in the appropriate spot	Pass
c)	When designing and constructing machinery, and when drafting the instruction, the manufacturer must envisage not the normal use of the machinery but also uses which could reasonably be expected	All the conditions are considered by the manufacturer, and the related information also has been provided within the instruction manual	Pass
	The machinery must be designed to prevent abnormal use if such use would engender a risk. In other cases the instructions must draw the user's attention to ways which experience has shown might occur-in which the machinery should not be used	These requirements have been complied with, and the related information also has been provided within the instruction manual.	Pass
d)	Under the intended conditions of use, the discomfort, fatigue and psychological stress faced by the operator must be reduced to the minimum possible taking ergonomic principles into account	These requirements have been taken into account during the design of this machine	Pass
e)	When designing and constructing machinery, the manufacturer must taken account of the constraints to which the operator is subject as a result of the necessary or foreseeable use of personal protection equipment	These requirements have been taken into account during the design of this machine	Pass
f)	Machinery must be supplied with all the essential special equipment and accessories to enable it to be adjusted, maintained and used without risk	All the essential special equipment and related accessories have been supplied.	Pass

1.1.3	Materials and products		-
	The materials used to construct machinery or products used and created during its use must not endanger exposed persons' safety or health	They cannot endanger exposed person's safety or health	Pass
	In particular, where fluids are used, machinery must be designed and constructed for use without risks due to rilling, use, recovery of draining		Not applicable
1.1.4	Lighting		-
	The manufacturer must supply integral lighting suitable for the operations concerned where its lack is likely to cause a risk despite ambient lighting of normal intensity	These requirements have been taken into account during the design of this machine.	Pass
	The manufacturer must ensure that, there is no area of shadow likely to cause nuisance, that there is no irritating dazzle and that there are no dangerous stroboscopic effects due to the lighting provided by the manufacturer		Not applicable
	Internal parts requiring frequent inspection, and adjustment and maintenance areas, must be provided with appropriate lighting		Not applicable
1.1.5	Design of machinery to facilitate its handling		-
	Machinery or each component part thereof must:		-
	-be capable of being handle safely	Enough measures have been taken to ensure the safe of the handling.	Pass
	-be packaged or designed so that it can be stored safely and without damage	The machine can be stored in fumigation wooden case safely and without damage.	Pass
	Where the weight, size or shape of machinery or its various component parts prevents them from being moved by hand, the machinery or each components part must:		-
	-either be fitted with attachments for lifting gear, or		Not applicable
	-be designed so that it can be fitted with such attachments, or	provided	Pass
	-be shaped in such a way that standard lifting can easily be attached		Not applicable
	Where machinery or one of its component parts is to be moved by hand, it must:		-
	-either be easily movable, or		Not applicable
	-be equipped for picking up and moving in complete safety		Not applicable
	Special arrangement must be made for the handling of tools and/or machinery parts, even if lightweight,which could be dangerous		Not applicable
1.2	Controls		-
1.2.1	Safety and reliability of control systems		-
	Control systems must be designed and constructed so that they are safe and reliable, in a way that will prevent a dangerous situation arising	The control system for this machine is safe and reliable by appropriate designing	Pass
	Above all they must be designed and constructed:		-

	-they can withstand the rigors of normal use and external factors	The control system can withstand related effects during normal operation.	Pass
	-errors in logic don't lead to dangerous situations		Not applicable
1.2.2	Control devices		-
	Control devices must be:		-
	-clearly visible and identifiable and appropriately marked where necessary	Appropriate lables and markings are provided This requirement has been complied with.	Pass
	-positioned for safe operation without hesitation or loss of time, and without ambiguity	Appropriate positions have been taken into account during design	Pass
	-designed so that the movement of the control is consistent with its effect		Not applicable
	-located outside the danger zones,except for certain controls where necessary, such as emergency stop, console for training of robots		Not applicable
	-positioned or that their operation can't cause additional risk	All operation of control devices won't cause additional risk.	Pass
	- designed or protected so that the desired effect, where a risk is involved, can't occur without an intentional operation	Appropriate safety devices have been used to comply with this requirement.	Pass
	- made so as to withstand foreseeable strain, particular attention must be paid to emergency stop devices liable to be subjected to considerable strain		Not applicable
	Where a control is designed and constructed to perform several different actions, namely where there is no one-to-one correspondence, the action to be performed must be clearly displayed and subject to confirmation where necessary		Not applicable
	Controls must be so arranged that their layout, travel and resistance to operation are compatible with the action to be performed, taking account of ergonomic principles	These requirements have been taken into account during design.	Pass
	Constraints due to the necessary foreseeable use of personal protection equipment must be taken into account		Not applicable
	Machinery must be fitted with indicators as required for safe operation	The indicators hace been provided.	Pass
	The operator must be able to read them from the control position	The indicators are clearly visible in the control position.	Pass
	From the main control position the operator must be able to ensure that there are no exposed persons in the danger zones	The danger zones are visible for the operator in the main control position.	Pass
	If this is impossible, the control system must be designed and constructed so that an acoustic and/or visual warning signal is given whenever the machinery is about to start		Not applicable

	The exposed person must have the time and the means to take rapid action to prevent the machinery starting up	Emergency stop, main switch and other related devices have been provided for the exposed person.	Pass
1.2.3	Starting		-
	It must be possible to start machinery only by voluntary actuation of a control provided for the purpose	Devices preventing unintended strating have been provided.	Pass
	The same requirement applied:		-
	-when restarting the machinery atfer stoppage, whatever the cause	Reset is necessary before restarting.	Pass
	-when effecting a significant change in the operating conditions		Not applicable
	Unless such restarting or change in operating conditions is without risk to exposed persons		-
	This essential requirement doesn't apply to the restarting of the machinery or to the change in operating conditions resulting from the normal sequence lf an automatic cycle		Not applicable
	Where machinery has several starting controls and the operators can therefore put each other in danger, additional devices must be fitted to rule out such risks		Not applicable
	It must be possible for automated plant functioning in automatic mode to be restarted easily after a stoppage once the safety conditions have been fulfilled		Not applicable
12.4	Stopping device		-
	Normal stopping		-
	Each machine must be fitted with a control whereby the machine can be brought safety to a complete stop	A normal stop control has been provided.	Pass
	Each workstation must be fitted with a control to stop some or all of the moving parts of the machinery, depending on the type of hazard, so that the machinery is rendered safe	A normal stop control has been provided.	Pass
	The machinery's stop control must have priority over the start controls	It has priority over the start control.	Pass
	Once the machinery or its dangerous parts have stopped,the energy supply to the actuators concerned must be cut off	The stops belong to the category 0,or category 1 stops.	Pass
	Emergency stop		-
	Each machinery must be fitted with one or more emergency stop devices to enable actual or impending danger to be averted		Not applicable
	The following exceptions apply:		-
	-machines in which an emergency stop device would not lessen the risk, either because it would not reduce the stopping time or because it would not enable the special measures requited to deal with the risk to be taken		Not applicable
	The emergency stop device must:		-
	-have clearly identifiable, clearly visible and quickly accessible controls		Pass
	-stop the dangerous process as quickly as possible, without creating additional hazards		Pass

	-where necessary, trigger or permit the triggering of certain safeguard movements		Not applicable
	Once active operation of the emergency stop control has ceased following a stop command, that command must be sustained by engagement of the emergency stop device until that engagement is specifically overridden		Not applicable
	It must be possible to disengage the device only by an appropriate operation, and disengaging the device must not restart the machinery but only permit restarting		Not applicable
	Complex installations		-
	In the case of machinery or parts of machinery designed to vvork together, must so design and construct the machinery that the stop controls, including the emergency stop, can stop not only the machinery itself but also all equipment upstream and/or downstream if its continued operation can be dangerous		Not applicable
1.2.5	Mode selection		-
	The control mode selected must override all other control systems with the exception of the emergency stop		Not applicable
	If machinery has been designed and built to allow for its use in several control or operating modes presenting different safety levels, it must be fitted with a mode selector which can be locked in each position		Not applicable
	Each position of the selector must correspond to a single operating or control mode	No this kind of mode selection has been found.	Not applicable
	The selector may be replaced by another selection method which restricts the use of certain functions of the machinery or certain categories of operator	No this kind of mode selection has been found	Not applicable
	If for certain operations, the machinery must be able to operate with its protection devices neutralized, the mode selector must simultaneously	No this kind of mode selection has been found	Not applicable
	- Disable the automatic control mode		Not applicable
	- Permit movements only by controls requiring sustained action		Not applicable
	- Permit the operation of dangerous moving parts only in enhanced safety conditions while preventing hazards from linked sequences		Not applicable
	- Prevent any movement liable to pose a danger by acting voluntarily or involuntarily on the machine’s internal sensors		Not applicable
	In addition, the operator must be able to control operation of the parts he is working on at the adjustment point	No this kind of mode selection has been found	Not applicable
1.2.6	Failure of the power supply		-
	The interruption, re-establishment after an interruption or fluctuation in whatever manner of the power supply to the machinery must not lead to a dangerous situation	No any dangerous situation has been found	Pass
	In particular:		-

	-the machinery must not start unexpectedly	Reset is necessary before restarting the machine	Pass
	- the machinery must not be prevented from stopping if the command has already been given		Not applicable
	- no moving part of the machinery or piece held by the machinery must fall or be ejected	No such part is found	Pass
	- automatic or manual stopping of the moving parts whatever they may be must be unimpeded		Not applicable
	-the protection devices must remain fully effective	The protection devices main effective after the failure	Pass
1.2.7	Failure of the control circuit		-
	A fault in the control circuit, or failure of or damage to the control circuit must not lead to dangerous situations	No dangerous situation is found.	Pass
	In particular:		-
	- the machinery must not start unexpectedly	Reset is necessary before restarting the machine	Pass
	-the machinery must not be prevented from stopping if the command has already been given		Not applicable
	-no moving part of the machinery or piece held by the machinery must fall or be ejected	No such part is found	Pass
	-automatic or manual stopping of the moving parts whatever they may be must be unimpeded		Not applicable
	-the protection device must remain fully effective	The protection devices remain effective after the failure of the control circuit	Pass
1.2.8	Software		-
	Interactive software between the operator and the command or control system of a machine must be user-friendly		Not applicable
1.3	Protection against mechanical hazards		-
1.3.1	Stability		-
	Machinery, components and fittings thereof must be so designed and constructed that they are stable enough, under the foreseen operating conditions for use without risk of overturning, falling or unexpected movement	These requirements have been taken into account design	Pass
	If the shape of the machinery itself or its intended installation doesn't offer sufficient stability, appropriate means of anchorage must be incorporated and indicated in the instructions	The sufficient stability has been offered for this machine	Pass
1.3.2	Risk of break-up during operation		-
	The various parts of machinery and their linkages must be able to withstand the stress to which they are subject when used when as foreseen by the manufacturer	All parts of the machine can withstand related stress when they are used.	Pass
	The durability of the materials used must be adequate for the nature of the workplace foreseen by the manufacturer, in particular as regards the phenomena of fatigue, aging, corrosion and abrasion	All materials used for this machine are appropriate for their intended use and have adequate life	Pass

	The manufacturer must indicate in the instructions the type and frequency of inspection and maintenance required for safety reasons, where appropriate, indicate the parts subject to wear and the criteria for replacement	The related information have been provided within the instruction manual.	Pass
	Where a risk of rupture or disintegration remains despite the measures taken the moving parts must be mounted and positioned in such away that in case of rupture their fragments will be contained	No such risk is possible.	Pass
	Both rigid and flexible pipes carrying fluids, particularly those under high pressure, must be able to withstand the foreseen internal and external stresses and must be firmly attached and/or protected against all manner to external stresses and strains, precaution must be taken to ensure that no risk is posed by a rupture	This requirement has been taken into account during design.	Pass
	Where the material to be processed is fed to the tool automatically, the following conditions must be fulfilled to avoid risks to the persons exposed:		-
	- when the work piece comes into contact the tool the later must have attained its normal working conditions		Not applicable
	- when the tool starts and/or stops the feed movement and the tool movement must be coordinated	Both are coordinated.	Not applicable
1.3.3	Risked due to falling or ejected objects		-
	Precautions must be taken to prevent risks from falling or ejected object		No applicable
1.3.4	Risks due to surfaces, edges or angles		-
	In so far as their purpose allows, accessible parts of the machinery must have no sharp edges, no sharp angles, and no rough surfaces likely to cause injury	No this kind injury has been found	No applicable
1.3.5	Risks related to combined machinery		-
	When the machinery is intended to carry out several different operations with the manual removal of the piece between each operation, it must be designed and constructed in such a way as to enable each element to be used separately without the other element constituting a danger or risk for the exposed person	No this kind of combined machinery.	Not applicable
	For this purpose, it must be possible to start and stop separately and elements that are not protected	No this kind of combined machinery	Not applicable
1.3.6	Risks relating to variations in the rotation speeds of tools		-
	When the machine is designed to perform operations under different conditions of use, it must be designed and constructed in such a way that selection and adjustment of these conditions can be carried out safely reliably		Not applicable
1.3.7	Prevention of risks related to moving parts		-

	The moving parts of machinery must be designed, built and laid out to avoid hazards or, where hazards persist, fixed with guards or protective devices in such a way as to prevent all risk of contact which could lead to accidents		Not applicable
	All necessary steps must be taken to prevent accidental blockage of moving parts involved in the work		Not applicable
	In cases where,despite the precaution taken,a blockage is likely to occur, specific protection devices or tools,the instruction handbook and possibly a sign on the machinery should be provided by the manufacturer to enable the equipment to be safely unblocked		Not applicable
1.3.8	Choice of protection against risk related to moving parts		-
	Guards or protection devices used to protect against the risks related to moving parts must be selected on the basis of the type of risk	It is accordance with the risk assessment	Pass
	The following guidelines must be used to help make the choice		-
	Moving transmission parts Guards designed to protect exposed persons against the risks associated with moving transmission parts must be:		-
	-either fixed, complying with requirements 1.4.1 and 1.4.2.1 or	See the related clauses.	Pass
	-movable, complying with requirements 1.4.1 and 1.4.2.2.A	See the related clauses.	Pass
	A moving parts directly involved in the process Guards or protection devices designed to protect exposed persons against the risks associated with moving parts contributing to the work must be		-
	-wherever possible fixed guards complying with requirements 1.4.1 and 1.4.2.1	See the related clauses.	Pass
	-otherwise,movable guards complying with requirements 1.4.1 and 1.4.2.2.B or protection devices intended automatically to prevent all part of the operator’s body from encroaching to the danger zone in accordance with requirements 1.4.1 and 1.4.3	See the related clauses.	Pass
	However,when certain moving parts directly involved in the process can’t be completely or partially inaccessible during operation owing to operations requiring near-by operator intervention,where technically possible such parts must be fitted with:		-
	-fixed guards, complying with requirements 1.4.1 and 1.4.2.1 preventing access to those sections of the parts that are not used in the work	See the related clauses.	Pass
	-adjustable guards, complying with requirements 1.4.1 and 1.4.2.3 restricting access to those sections of the moving parts that are strictly for the work	See the related clauses.	Pass

1.4	Required characteristics of guards and protection devices		-
1.4.1	General requirement		-
	Guards and protection devices must:		-
	-be of robust construction	All the guards have enough strength.	Pass
	-not give rise to any additional risk	No additional risk is found.	Pass
	-not be easy to bypass or render non-operational	All the guards can't be bypassed or rendered non-operational by design.	Pass
	-be located at an adequate distance from the danger zone	All the guards comply with the safety distances.	Pass
	-cause minimum obstruction to the view the production process	Appropriate materials are used to make guards.	Pass
	-enable essential work to be carried out on installation and/or replacement of tools and also for maintenance by restricting access only to the area where the work has to be done,if possible without the guard or protection device having to be dismantled		Pass
1.4.2	Special requirements for guards		-
1.4.2.1	Fixed guards		-
	Fixed guards must be fixed by systems that can be opened or removed only with tools	They all can be opened only with tools.	Pass
	Their fixing systems must remain attached to the guards or to the machinery when the guards are removed	Yes,they are attached to the guards because the screws are fixed by nutcap.	Pass
	Where possible,guards must be incapable of remaining in place without their fixings		Pass
1.4.2.2	Movable guards		-
	A.Type A movable guards must:		-
	-as far as possible remain fixed to the machinery when open		Not applicable
	-be associated with a locking device to prevent moving parts starting up as these parts can be accessed and to give a stop command whenever they are no longer closed		Not applicable
	B.Type B movable guards must be designed and incorporated into the control system so that		Not applicable
	-moving parts can't start up while they are within the operator's reach		Not applicable
	-the exposed person can't reach moving parts once they have started up		Not applicable
	-they can be adjusted only by means of an intentional action,such as the use of a tool,etc		Not applicable
	-the absence or failure of one of their components prevents starting or stops the moving parts		Not applicable
	-protection against any risk of ejection is provided by means of an appropriate barrier		Not applicable
1.4.2.3	Adjustable guards restricting access		-

	Adjustable guards restricting access to those areas of the moving parts strictly necessary for the work must:		Not applicable
	-be adjustable manually or automatically according to the type of work involved		Not applicable
	-be readily adjustable without the use of tools		Not applicable
	-reduce as far as possible the risk of ejection		Not applicable
1.4.3	Special requirements for protection devices		-
	Protection devices must be designed and incorporated into the control system so that:		-
	-moving parts can't start up while they are within the operator's reach		Not applicable
	-the exposed person can't reach moving parts once they have started up		Not applicable
	-they can be adjusted only by means of an intentional action, such as the use of a tool, etc.		Not applicable
	-the absence or failure of one of their components prevents starting or stops the moving parts		Not applicable
1.5	Protection against other hazards		-
	Electricity supply		-
	Where machinery has an electricity supply it must be designed, constructed and equipped so that all hazards of an electrical nature are or can be prevented	See the EN 60204-1 test report in detail.	Pass
	The specific rules in force relating to electrical equipment designed for use within certain voltage limits must apply to machinery which is subject to those limits	See the EN 60204-1 test report in detaill.	Pass .
1.5.2	Static electricity		-
	Machinery must be so designed and constructed as to prevent or limit the build-up of potentially dangerous electrostatic charges and/or be fitted with a discharging system	See the EN 60204-1 test report in detail.	Pass
1.5.3	Energy supply other than electricity		-
	Where machinery is powered by an energy other than electricity, it must be so designed, constructed and equipped as to avoid all potential hazards associated with these types of energy	No any additional hazard has been found for energy supply.	Not applicabe
1.5.4	Error of fitting		-
	Errors likely to be made when fitting or refitting certain parts which could be a source of risk must be made Impossible by the design of such parts or, failing this, by information on moving parts and/or their housing where the direction of movement must be known to avoid a risk	These requirements have been taken into account during design.	Pass
	Any further information that may be necessary must be given in the instructions	The related information has been provided within the instruction manual.	Pass

	Where a faulty connection can be the source of risk, incorrect fluid connections, including electrical conductors, must be made impossible by the design or, failing this, by information given on the pipes, cables, etc. and/or connectors blocks	All related information have been provided within the instruction manual. Necessary labels and markings have been provided.	Pass
1.5.5	Extreme temperatures		-
	Step must be taken to eliminate any risk of injury caused by contact with or proximity to machinery parts or materials at high or very low temperatures		Not applicable
	The risk of hot or very cold materials being ejected should be assessed. Where this risk exists, the necessary steps must be taken to prevent it or, if this is not technically possible,to render it non-dangerous	No this kind of risk exists	Not applicable
1.5.6	Fire		-
	Machinery must be designed and constructed to avoid all risk of fire or overheating posed by the machinery itself of by gases ,liquids, dusts, vapors or the other substances produced or used by the machinery	The design and construction of this machine are in conformity with these requirements.	Pass
1.5.7	Explosion		-
	Machinery must be designed and constructed to avoid any risk of explosion posed by the machinery itself or by gases, liquids, dusts, vapors or other substances produced or used by the machinery	No such risk is found.	Not applicable
	To that end the manufacturer must take steps to:		-
	-avoid a dangerous concentration of products		Not applicable
	-prevent combustion of the potentially explosive atmosphere		Not applicable
	-minimize any explosion which may occur so that it doesn't endanger the surroundings		Not applicable
	The same precautions must be taken if the manufacturer foresees the use of the machinery in potentially explosive atmosphere	This machine is not intended to be used in potentially explosive atmosphere.	Not applicable
1.5.8	Electrical equipment forming part of the machinery must conform, as far as the risk from explosion is concerned, to the provision of the specific directive in force		Pass
1.5.8	Noise		-
	Machinery must be so designed and constructed that risks resulting from the emission of airborne noise are reduced to the lowest level taking accounting of technical progress and the availability of means of reducing noise, in particular at source	The design and construction of this machine are in conformity with this requirements.	Pass
1.5.9	Vibration		-

	Machinery must be so designed and constructed that risks resulting from the vibrations produced by the machinery are reduced to the lowest level, taking account of technical progress and the availability of means of reducing vibration, in particular at source	The design and construction of this machine are in conformity with this requirements. Vibrations of this machine will not creat any risk.	Pass
1.5.10	Radiation		-
	Machinery must be so designed and constructed that any emission of radiation is limited to the extent necessary for its operation and that the effects on exposed persons non-existent or reduced to non-dangerous proportions		Not applicable
1.5.11	External radiation		-
	Machinery must be so designed and constructed that external radiation doesn't interfere with its operation		Not applicable
1.5.12	Laser equipment		-
	Where laser equipment is used ,the following provisions should be taken into account;	No laser equipment has been used.	Not applicable
	-laser equipment on machinery must be designed and constructed so as to prevent any accidental radiation		Not applicable
	-laser equipment on machinery must be protected so that effective radiation, radiation produced by reflection or diffusion and secondary radiation don't damage health		Not applicable
	-optical equipment for the observation or adjustment of laser equipment on machinery must be such that on health risk is created by the laser rays		Not applicable
1.5.13	Emission of dust, gases, etc		-
	Machinery must be so designed, constructed and/or equipment that risk due to gases, liquids, dust, vapors and other waste materials which it produces can be avoided		Not applicable
	Where a hazard exists, the machinery must be so equipped that the said substances can be contained and/or evacuated		Not applicable
	Where machinery is not enclosed during normal operation, the devices for containment and/or evacuation must be situated as close as possible to the source emission		Not applicable
1.5.14	Risk of being trapped in a machine		-
	Machinery must be so designed, constructed or fitted with a means of preventing a exposed person from being enclosed within it or, if that is impossible, with a means of summoning held	No this kind of hazard	Not applicable
1.5.15	Risk of slipping, tripping or falling		-
	Parts of the machinery where persons are liable to move about or stand must be designed and constructed to prevent persons slipping tripping or falling on or off these parts		Not applicable
1.6	Maintenance		-
1.6.1	Machinery maintenance		-

	Adjustment,lubrication and maintenance points must be located outside danger zones	The design and construction of this machine are in conformity with this requirements	Pass
	It must be possible to carry out adjustment, maintenance, repair, cleaning and servicing operations while machinery is at a standstill	Maintenance, repair, cleaning and servicing operations can only be implemented while machinery is at a standstill	Pass
	If one or more of the above conditions can't be satisfied for technical reasons, operations must be possible without risk	No this kind of situation	Not applicable
	In the case of automated machinery and, where necessary, other machinery, the manufacturer must take provision for a connecting device for mounting diagnostic fault-finding equipment		Not applicable
	Automated machine components which have to be changed frequently, in particular for a change in manufacture or where they are liable to wear or likely to deteriorate following an accident, must be capable of being removed and replaced easily and in safety		Not applicable
	Access to the components must enable these tasks to be carried out with the necessary technical means in accordance with an operating method specified by the manufacturer	All operation methods have been specified by the manufacturer	Pass
1.6.2	Access to operating position and servicing points		-
	The manufacturer must provide means of access to all areas used for production, adjustment and maintenance operations		Not applicable
1.6.3	Isolation of energy sources		-
	All machinery must be fitted with means to isolate it from all energy sources		Pass
	Such isolators must be clearly identified		Pass
	They must be capable of being locked if reconnection could endanger exposed persons		Not applicable
	In the case of machinery supplied with electricity through a plug capable of being plugged into a circuit, separation of the plug is sufficient		Not applicable
	The isolator must be capable of being locked also where an operator is unable ,from any of the points to which he has access ,to check that the energy is still cut off	The isolator can be locked in the off position	Pass
	After the energy is cut off, it must be possible to dissipate normally any energy remaining or stored in the circuits of the machinery without risk to exposed persons	All the parts will not be live after the energy is cut off.	Pass

	As an exception to the above requirement, certain circuits may remain connected to their energy source in order, for example, to hold parts, protect information, light interiors, etc. In this case,special steps must be taken to ensure operator safety	No this kind of situation	Not applicable
1.6.4	Operator intervention		-
	Machinery must be so designed,constructed and equipped that the need for operator intervention is limited		Not applicable
	If operator intervention can't be avoided, it must be possible to carry it out easily and in safety	No this kind of situation	Not applicable
1.6.5	Cleaning of internal parts		-
	The machinery must be designed and constructed in such a way that it is possible to clean internal parts which have contained dangerous substances or preparations without entering them;any necessary unblocking must also be possible form the outside .	The design of this machine is allowed to carried out this work	Pass
	If it is absolutely impossible to avoid entering the machinery, the manufacturer must take steps during its construction to allow cleaning to take place with the minimum of danger .	No this kind of situation	Not applicable
1.7	Indicators		-
1.7.1	Information devices		-
	The information needed to control machinery must be unambiguous and easily understood	The information is identified clearly and can be easily understood	Pass
	It must not be excessive to the extent of overloading the operator		Pass
	Where the health and safety of exposed persons may be endangered by a fault in the operation of unsupervised machinery, the machinery must be equipped to give an appropriate acoustic or light signal as a warning		Pass
1.7.2	Warning devices		-
	Where machinery is equipped with warning devices, these must be unambiguous and easily perceived		Pass
	The operator must have facilities to check the operation of such warning devices at all times		Pass
	The requirements of the specific directives concerning colors and safety signals must be complied with		Pass
1.7.3	Warning of residual risks		-
	Where risks remain despite all the measure adopted or in the case of potential risk which are not evident, the manufacture must provide warning	No any residual risk has been found	Not applicable

	Such warning should preferably use readily understandable pictograms and\or be drawn up in one of the languages of the country in which the machinery is to be used, accompanied, on request, by the languages understood by the operator		Not applicable
1.7.4	Marking		-
	All machinery must be marked legibly and indelibly with the following minimum particular:		-
	Name and address of the manufacturer	Name and address of the manufacturer has been marked has been marked in the nameplate	Pass
	CE mark, which includes the year of construction		Pass
	Designation of series or type	Designation of series or type has been marked in the nameplate	Pass
	Serial number, if any	Serial number has been marked in the nameplate	Pass
	Furthermore,where the manufantuer constructs machinery intended for use in a potentially explosive atmosphere, this must be indicated on the machinery	This machine is not intended to be used in a potentially explosive atmosphere	Not applicable
	Machinery must also bear full information relevant to its type and essential to its safe use	Such information is provided	Pass
	Where a machine part must be handled during use with lifting equipment, its mass must be indicated legible, indelibly and unambiguously		Not applicable
	The interchangeable equipment referred to in article 1(2), third subparagraph, must bear the same information	All the related information is provided legible, indelibly and unambiguously.	Pass
1.7.5	Instruction		-
	a)All machinery must be accompanied by instructions including at least the following :		-
	a repeat of the information with which the machinery is marked, except the serial number, together with any appropriate additional information to facilitate maintenance	All related information has been provided within the instruction manual l	Pass
	-foreseen use of the machinery within the meaning of 1.1.2(c)	All related information has been provided within the instruction manual	Pass
	-workstation(s) likely to be occupied by operators	All related information has been provided within the instruction manual	Pass
	- instuctions for safe	All related information has been provided within the instruction manual	Pass
	- putting into service	All related information has been provided within the instruction manual	Pass
	-use		-
	-handing, giving the mass of the machinery and its various parts where they are regularly to be transported separately	All related information has been provided within the instruction manual	Pass

	- installation	All related information has been provided within the instruction manual	Pass
	- assembling, dismantling		Pass
	- adjustment		Pass
	- maintenance (servicing and repair)		Pass
	-where necessary, training instructions		Pass
	Where necessary, the essential characteristics of tools which may be fitted to the machinery		Pass
	Where, necessary, the instructions should draw attention to ways in which the machinery should not be used	All related information has been provided within the instruction manual	Pass
	b)The instructions must be drawn up in one of the community languages by the manufacturer or his authorized representative established in the community	Chinese and English versions of the instuction manual is provided	Pass
	On being put into service, all machinery must be accompanied by a translation of the instructions in the language or languages of the country in which the machinery is to be used and by the instructions in the original language	English versions of the instruction manual is provided.	Pass
	This translation must be done either by the manufacturer or his authorized representative established in the community or by the person introducing the machinery into the language area in question	The translation is done by the manufacturer.	Pass
	By way of derogation from this requirement, the maintenance instructions for use by the specialized personnel employed by the manufacturer or his authorized representative established in the Community may be drawn up in only one of the Community languages understood by that personnel		Pass
	c)The instructions must contain the drawing and diagrams necessary for putting into service, maintenanc inspection, checking of correct operation and, where appropriate, repair of the machinery and all useful instructions in particular with regard to safety	All related information has been provided within the instruction manual	Pass
	d) any literature describing the machinery must not contradict the instructions as regards safety aspects	No such situation exist.	Pass
	The technical documentation describing the machinery must give information regarding the airborne noise emission referred to in(f) and, in the case of hand-held and/or hand-guided machinery, information regarding vibration as referred to in 2.2	All related information has been provided within the technical documentation.	Pass
	e) Where necessary, the instructions must give the requirement relating to installation and assembly for reducing noise or vibration		Not applicable

	f) The instructions must give the following information concerning airborne noise emission by the machinery, either the actual value or a value established on the basis of measurements made on identical machinery:		-
	equivalent continuous A-weighted pressure level at workstations, where this exceeds 70 dB(A); where this level doesn't exceed 70dB(A), this fact must be indicated	The noise pressure level is 65dB.	Pass
	peak C-weighted instantaneous sound pressure value at workstations, where this exceeds 63 Pa(130 dB in relation to 20 mPa)		Not applicable
	sound power level emitted by the machinery where the equivalent continuous a weight sound pressure level at workstations exceeds 85 dB(A)		Not applicable
	In the case of very large machinery, instead of the sound power level, the equivalent continuous sound pressure levels at specified positions around the machinery may be indicated	This machine is not a very large machinery.	Not applicable
	Where the harmonized standards are not applied sound levels must be measured using the most appropriate method for the machinery	Appropriate standards are applied to determine the sound level.	Pass
	The manufacturer must indicate the operating conditions of the machinery during measurement and what methods have been used for the measurement	All related information has been provided within the technical documentation.	Pass
	Where the workstation(s) are undefined or can't be defined, sound pressure levels must be measured at a distance of 1 meter from the surface of the machinery and at a height of 1.60 meters from the floor or access platform	The workstation has been defined.	Pass
	The position and value of the maximum sound pressure must be indicated	It has been indicated in the appropriate position of the machine.	Pass
	g) If the manufacturer foresees that the machinery will be used in a potentially explosive atmosphere, the instructions must give all the necessary information	This machine is not intended to be used in a potentially explosive atmosphere.	Not applicable
	h) In the case of machinery which may also be intended for use by non-professional operators, the wording and layout of the instructions for use, whilst respecting the other essential requirement mentioned above, must take into account the level of general education and acumen that can reasonably be expected from such operators	All these requirements have been taken into account.	Pass
2	Essential health and safely requirements for certain categories of machinery		-
2.1	Agri-foodstuffs machinery		-
	Where machinery is intended to prepare and process foodstuffs, it must be so designed and constructed as to avoid any risk of infection, sickness or contagion and the following hygiene rules must be observed:		Not applicable

	a) materials in contact, or intended to come into contact, with the foodstuffs must satisfy the conditions set down in the relevant directives		Not applicable
	The machinery must be so designed and constructed that these materials can be clean before each use		Not applicable
	b) all surfaces including their joinings must be so smooth, and must have neither ridges nor crevices which could harbor organic materials		Not applicable
	c) assemblies must be designed in such a way as to reduce projections, edges and recesses to a minimum		Not applicable
	They should preferably by made by welding or continuous bonding		Not applicable
	Screws, screw heads and rivets may not be used except where technically unavoidable		Not applicable
	d) all surfaces in contact with the foodstuffs must be easily cleaned and disinfected, where possible after removing easily dismantled parts		Not applicable
	The inside surfaces must have curves of a radius sufficient to allow through cleaning		Not applicable
	e) liquid deriving from foodstuffs as well as cleaning disinfecting and rinsing fluids should be able to be discharged from the machine without impediment		Not applicable
	f) machinery must be so designed and constructed as to prevent any liquids or living creatures, in particular insects, entering, or any organic matter accumulating in area that can't be cleaned		Not applicable
	g) machinery must be so designed and constructed that no ancillary substances can come into contact with foodstuffs		Not applicable
	Where necessary, machinery must be designed and constructed so that continuing compliance with this requirement can be checked		Not applicable
	Instructions		Not applicable
	In addition to the information required in Section 1, the instructions must indicate recommended products and methods for cleaning, disinfecting and rinsing(not only for easily accessible areas but also where areas to which access is impossible or inadvisable, such as piping, have to be cleaned in it situ)		Not applicable
2.2	Portable hand-held and or hand-guided machinery		-
	Portable hand-held and/or hand-guided machinery must conform to the following essential health and safety requirements:		-

	-according to the type of machinery, it must have a supporting surface of sufficient size and have a sufficient number of handles and supports of an appropriate size and arranged to ensure the stability of the machinery under the operating conditions foreseen by the manufacturer		Not applicable
	-except where technically impossible or where there is an independent control, in the case of handles which can't be released in complete safety, it must be fitted with start and stop controls arranged in such a way that the operator can operate them without releasing the handles		Not applicable
	-it must be designed, constructed or equipped to eliminate the risks of accidental starting and/or continued operation after the operator has released the handles		Not applicable
	Equivalent steps must be taken if the requirement is not technically feasible		Not applicable
	-portable hand-held machinery must be designed an constructed to allow, where necessary, a visual check of the contact of the tool with the material being processed		Not applicable
	Instructions		-
	The instructions must give the following information concening vibrations transmitted by hand-held and hand-guided machinery		-
	-the weight root mean square value to which the arms are subjected, if it exceed 2.5 m/s^2 as determined by the appropriate test code		Not applicable
	Where the acceleration doesn't exceed 2.5 s/m^2, this must be mentioned		Not applicable
	If there is no applicable test code, the manufacturer must indicate the measurement methods and conditions under which measurement were made		Not applicable
2.3	Machinery for working wood and analogous materials		-
	Machinery for working wood and machinery for working materials with physical and technology characteristics similar to those of wood, such as cork, bone, hardened rubber, hardened plastic material and other similar stiff material must conform the following essential health and safety requirements		-
	a) the machinery must be designed, constructed or equipped so that the piece being machined can be placed and guided in safety, where the piece is hand-held on a work-bench the later must be sufficiently stable during the work and must not impede the movement of the piece	This requirement has been taken into account during design	Pass

	b) where the machinery is likely to be used in conditions involving the risk of ejection of pieces of wood, it must be designed, constructed or equipped to eliminate this ejection, or, if this is not the case, so that the ejection doesn't engender risks for the operator and or exposed persons		Not applicable
	c) the machinery must be equipped with an automatic brake that stops the tool in a sufficiently short time if there is a risk of contact with the tool whilst it runs down		Not applicable
	d) where the tool is incorporated into a non-fully automated machine, the latter must be so designed and constructed as eliminate or reduce the risk of serious accidental injury		Not applicable
3	Essential health and safety requirement to offset the particular hazards due to the mobility machinery		-
4	Essential health and safety requirement to offset the particular hazards due to a lifting operation		-
5	Essential health and safety requirement for machinery intended for underground work		-
6	Essential health and safety requirement to offset the particular hazards due to the lifting or moving of persons		-

2.2 Risk assessment

Product: OTTOVAC

All models: OTTOVAC-V1(OV-V1)

In general this risk assessment report for **OTTOVAC** by **Nemo Power Tools(Huizhou) Co., Ltd.** were carried out in accordance with the requirements of Machinery Directive(2006/42/EC) and based on the standards of EN ISO 12100:2010 in which an explicit risk level is evaluated with 4 factors described in the next clause.

After fist assessment, some measures to eliminate the risk are given for the modification of machine or of relative document with taking into account the Related B-type standard.

While taking appropriate provisions for the existing risks the procedures and principles to eliminate the risk according to most general B type standard for any kind of machine, EN ISO 12100 part 1 are followed .i.e:

First step: consider the possibility of eliminating risk at design stage.

Second step: if impossible, protect the dangerous zone with appropriate design of safety guard or safety device.

Third step: if above impossible, give warning sign to draw attention of operators about the residual risks.

Finally the risk assessment was carried out again to ensure this machine and its relative documents are totally compliance with the Machinery Directive.

This risk assessment report is based on methods mentioned in the EN ISO 12100:2010, and the 4 factors S-F-O-A have been used for evaluating the level of risks.

- Severity of harm: S

l) S1 slight injury (usually reversible), for example, scratches, laceration，bruising, light wound requiring first aid).

- Frequency and/or duration of exposure to hazard: F

1) F1 twice or less per work shift of less than 15 min cumulated exposure per work shift

2) F2 more than twice per work shift or more than 15 min cumulated exposure per work shift.

- Probability of occurrence of the hazardous event: O

1) O l mature technology, proven and recognized in safety application; robustness

2) O2 technical failure observed in the two last years

- Inappropriate human action by a well-trained person aware of the risks and having more than six months experience on the work station.

3) O3 technical failure regularly observed (every six months or less)

- Inappropriate human action by an untrained person having less than six months experience on the work station;

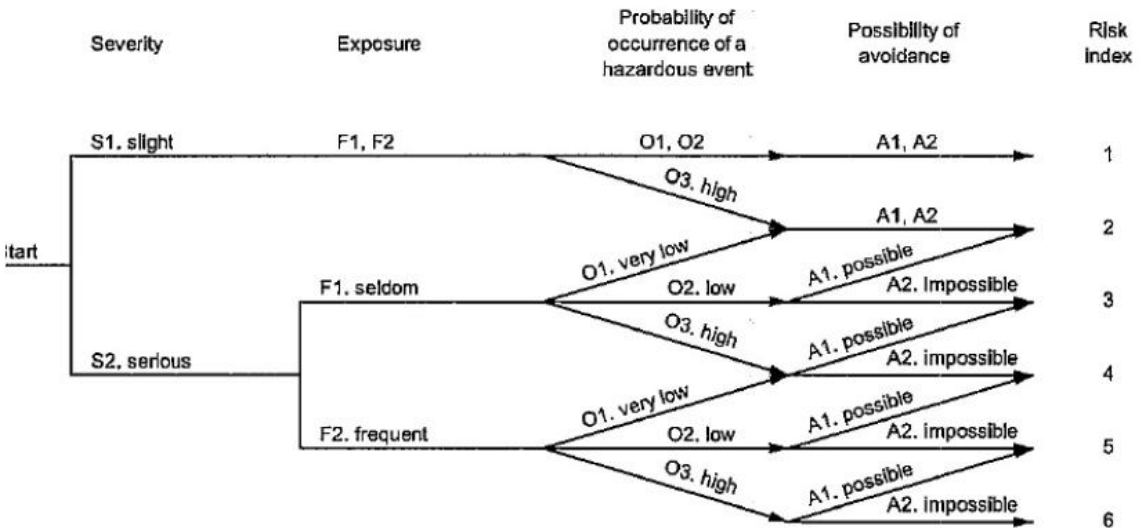
- Similar accident observed in the plant in the preceding ten years

- Possibility of avoidance or reduction of harm: A

1) Al Possible under some conditions and the exposed worker is familiar with the risks and with the indications of a hazardous situation or impending hazardous event;

-depending on particular conditions (temperature, noise, ergonomics, ect);

2) A2 impossible.



Solutions for the risk index of hazards

1: Protected by warning sign

2: Protected by guard and warning sign

3: Consider the other design, choose the best one, add both guard and warning sign

4: Consider another two designs, choose the best one, add both guard and warning sign

5 and 6: Consider another three designs, choose the best one, add both guard and warning

No.	Hazards source		S	F		O	Risk Index
Mechanical hazards							
1.1	**Crushing**	**N**					
1.2	**Shearing**	**N**					
1.3	**Cutting or severing**	**N**					
1.4	**Entanglement**		**1**	**1**	**1**	**1**	**0**
1.5	**Drawing-in or trapping**		**1**	**1**	**1**	**1**	**0**
1.6	**Impact**	**N**					
1.7	**Stabbing or puncture**	**N**					
1.8	**Friction or abrasion**	**N**					
1.9	**High pressure fluid injection or ejection**	**N**					

1.10	**The mechanical hazards are generated by:**	**N**					
	shape	**N**					
	relative location	**N**					
	Stability against overturning	**N**					
	Mass and stability	**N**					
	mass and velocity	**N**					
	acceleration/deceleration	**N**					
	Inadequate mechanical	**N**					
	Potential energy of elastic elements (springs), or of liquids or gases under pressure or vacuum	**N**					
	working environment	**N**					
Electrical hazards							
2.1	**Contact with live parts**		**1**	**1**	**1**	**1**	**1**
2.2	**Contact with parts which have become live under faulty conditions**		**1**	**1**	**1**	**1**	**1**
2.3	**Approach to live part under high voltage**	**N**					
2.4	**insulation not suitable**	**N**					
2.5	**Electrostatic phenomena**		**1**	**1**	**1**	**1**	**1**
2.6	**Thermal radiation or other phenomena such as projection of molten particles and chemical effects from short circuits, overloads etc.**	**N**					
2.7	**phenomena such as projection of molten particles or chemical effects from short-circuits or overloads**	**N**					

Thermal hazards							
3.1	**Burns, scalds and other injuries by a possible contact of persons with objects or materials with an extreme high or low temperature, by flames or explosions and also by the radiation of heat sources**	**N**					
3.2	**Damage to health by hot or cold working environment**	**N**					
Hazards generated by noise							
4.1	**Hearing loss**	**N**					
4.2	**tinnitus**	**N**					
4.3	**tiredness, stress**	**N**					
4.4	**other effects such**	**N**					
4.5	**Interference with speech communication, acoustic signals, etc.**	**N**					

Hazards generated by vibration							
5.1	**Use of hand held machines resulting in a variety of neurological and vascular disorder**	**N**					
5.2	**Whole body vibration, particular when combined with poor postures**	**N**					
Hazards generated by radiation							
6.1	**Low frequency, radio frequency radiation, microwaves**	**N**					
6.2	**Infrared, visible and ultraviolet light**	**N**					
6.3	**Lasers**	**N**					
6.4	**X and gamma rays**	**N**					
6.5	**Alpha, beta rays, electron or ion beams, neutrons**	**N**					
Hazards generated by materials and substances							
7.1	**Hazards from contact with or inhalation of harmful fluids, gases, mists, fumes and dusts**	**N**					
7.3	**Biological and microbiological (viral or bacterial) Hazards**	**N**					

Hazards generated by neglecting ergonomic principles in machine design							
8.1	**physiological effects (e.g. musculo -skeletal disorders) resulting, e.g. from unhealthy postures, excessive or repetitive efforts;**	**N**					
8.2	**psycho-physiological effects generated by, e.g. mental overload or under load, or stress, arising from the operation, supervision or maintenance of a machine within the limits of its intended use;**	**N**					
8.3	**Human error**	**N**					
Slipping, tripping and falling hazards							
9	**Neglecting the surface of the floorings and access means may result in injuries from slips, trips or falls.**	**N**					
Hazard combinations							
10	**Some individual hazards which seem to be minor can, when combined with each other, be equivalent to a significant hazard.**	**N**					
Hazards associated with the environment in which the machine is used							

11	**Where a machine is designed to operate under environmental conditions which can result in hazards (e.g. temperature, wind, snow, lightning) these hazards shall be taken into account.**	**N**					

Part Ⅲ: Test Report

3.1 EN ISO 12100: 2010 test report

6	Risk reduction		-
6.1	General		-
	The objective of risk rduction can be achieved by the elimination of hazards, or by separately or simultaneously reducing each of the two elements that determine the associated risk: -severity of harm from the hazard under consideration -probability of occurrence of that harm All protective measures intended for reaching this objective shall be applied in the following sequence, referred to as the three-step method(see also Figures 1 and 2)	This requirement is complied with. See related clauses.	Pass
6.2	Inherently safe design measures		–
6.2.1	General		–
	Inherently safe design measures are the first and most important step in the risk reduction process because protective measures inherent to the characteristics of the machine are likely to remain effective,whereas experience has shown that even well-designed safeguarding may fail or be violated and information for use may not be followed.	Appropriate machine design has been performed by the manufacturer.	Pass
	Inherently safe design measures are achieved by avoiding hazards or reducing risks by a suitable choice of design features of the machine itself and/or interaction between the exposed persons and the machine. NOTE See 6.3 for safeguarding and complementary measures that can be used to achieve the risk reduction objectives in the case where inherently safe design measures are not sufficient (see 6.1 for the three-step method).	Appropriate machine design has been performed by the manufacturer.	Pass
6.2	Consideration of geometrical factors and physical aspects		–
6.2.2.1	Geometrical factors such factors include the following.		–

	a) The form of machinery is designed to maximize direct visibility of the working areas and hazard zones from the control position—reducing blind spots, for example—and choosing and locating means of indirect vision where necessary(mirrors, etc.) so as to take into account the characteristics of humanvision, particularly when safe operation requires permanent direct control by the operator, for example: -the travelling and working area of mobile machines; -the zone of movement of lifted loads or of the carrier of machinery for lifting persons: -the area of contact of the tool of a hand-held or hand-guided machine with the material being worked. The design of the machine shall be such that, from the main control position, the operator is able to ensure that there are no exposed persons in the danger zones.	Appropriate machine design has been performed by the manufacturer.	Pass
	b) The form and the relative location of the mechanical components parts: for instance, crushing and shearing hazards are avoided by increasing the minimum gap between the moving parts, such that the part of the body under consideration can enter the gap safely, or by reducing the gap so that no part of the body can enter it (see ISO 13854 and ISO 13857).	Appropriate machine design has been performed by the manufacturer.	Pass
	c) Avoiding sharp edges and corners, protruding parts: in so far as their purpose allows, accessible parts of the machinery shall have no sharp edges, no sharp angels, no rough surfaces, no protruding parts likely to cause injury, and no openings which can“trap”parts of the body or clothing. In particular, sheet metal edges shall be deburred, flanged or trimmed, and open ends of tubes which can cause a“trap”shall be capped.	Appropriate machine design has been performed by the manufacturer.	Pass
	d) The form of the machine is designed so as to achieve a suitable working position and provide accessible manual controls (actuators).	Appropriate machine design has been performed by the manufacturer.	Pass
6.2.2.2	Physical aspects		-
	Such aspects include the following:		-
	a) limiting the actuating force to a sufficiently low value so that the actuated part does not generate a mechanical hazard;	The actuating force has been limited to be a sufficiently low value so that the actuated part dose not generate a mechanical hazard.	Pass
	b)limiting the mass and/or velocity of the movable elements, and hence their kinetic energy;	This have been limited.	Pass

	- c) limiting the emissions by acting on the characteristics of the source using measures for reducing 1)noise emission at source (see ISO/TR 11688-1), 2)the emission of vibration at source, such as redistribution or addition of mass and changes of process parameters [for example, frequency and/or amplitude of movements (for hand-held and hand-guided machinery, see CR 1030-1)], 3)the emission of hazardous substances, including the use of less hazardous substances or dust-reducing processes (granules instead of powders, milling instead of grinding), and 4)radiation emissions including, for example, avoiding the use of hazardous radiation sources, limiting the power of radiation to the lowest level sufficient for the proper functioning of the machine, designing the source so that the beam is concentrated on the target, increasing the distance between the source and the operator or providing for remote operation of the machinery [measures for reducing emission of non-ionizing radiation are given in 6.3.4.5 (see also EN 12198-1 and EN 12198-3)].	The emissions by acting on the characteristics of the source have been limited.	Pass
6.2.3	Taking into account the general technical knowledge regarding machine design This general technical knowledge can be derived from technical specifications for design (e.g. standards, design codes, calculation rules).These should be used to cover :		-
	a) mechanical stresses such as		-
	-stress limitation by implementation of correct calculation, construction and fastening methods as regards, e.g. bolted assemblies, welded assemblies	Has been taken into account.	Pass
	-stress limitation by overload prevention, (e.g. "fusible" plugs, pressure-limiting valve, breakage points, torque-limiting devices);	Has been taken into account.	Pass
	- avoiding fatigue in elements under variable stresses（notably cyclic stresses）;	Has been taken into account	Pass
	- static and dynamic balancing of rotating elements;	Has been taken into account	Pass
	b) materials and their properties such as		-
	- resistance to corrosion, ageing, abrasion and wear;	It has appropriate coating	Pass
	- hardness, ductility, brittleness;	The materials have been treated by appropriate methods	Pass
	- homogeneity	The materials have been treated by appropriate methods	Pass
	- toxicity	The materials is non-toxicity	Pass

	- flammability	The materials no flammability	Pass
	c) emission values for:		-
	- noise;	No noise will result in hazard in this machine.	Pass
	- vibration;	No vibration will result in hazard in this machine.	Pass
	- hazardous substances;	No hazardous substances will result in hazard in this machine.	Pass
	- radiation.	No radiation will result in hazard in this machine.	Pass
	When the reliability of particular components or assemblies is critical for safety (e.g. ropes, chains, lifting accessories for lifting loads or persons), stress values shall be multiplied by appropriate working coefficients.	Appropriate working coefficients have been taken into account during design and calculation.	Pass
6.2.4	Choice of an appropriate technology		-
	One or more hazards can be eliminated or risks reduced by the choice of the technology to be used in certain applications, e. g.:		-
	a)on machines intended for use in explosive atmospheres: -fully pneumatic or hydraulic control system and machine actuators: -"intrinsically safe" electrical equipment (see IEC60079-11)		Not applicable
	b)for particular products to be processed such as a solvent:equipment assuring that the temperature will remain far below the flash point.		Not applicable
	c)alternative equipment to avoid high noise level,e.g.: -electrical instead of pneumatic equipment - in certain conditions,water cutting instead of mechanical equipment.		Not applicable
6.2.5	Applying the principle of the positive mechanical action		-
	Positive mechanical action is achieved when a moving mechanical component inevitably moves another component along with it,either by direct contact or via rigid elements. An example of this positive opening operation of switching devices in an electrical circuit (see IEC 60947-5-1 and ISO 14119)	The principle of the positive mechanical action of a component on another component has been applied	Pass
6.2.6	Provisions for stability		-
	Machines shall be designed to have sufficient stability to allow them to be used safely in their specified conditions of use.	Satisfied it.	Pass
	Factors to be taken into account include		-

	-geometry of the base; -weight distribution,including loading; -dynamic forces due to movements of parts of the machine itself,or of elements held by the machine which may result in an overturning moment; -vibration	Taken into account during design.	Pass
	-oscillations of the centre of gravity;		Not applicable
	-characteristics of the supporting surface in case of traveling or installation on different sites (e.g.ground conditions,slope);	Taken into account during design.	Pass
	-external forces (e.g.wind pressure,manual forces)	Taken into account during design.	Pass
	Stability shall be considered in all phases of the life of the machine,including handling, traveling,installation,use,de-commissioning and dismantling.	Taken into account during design.	Pass
	Other protective measures for stability relevant to safeguarding are given in 6.3.2.6	Please see the related clause.	Pass
6.2.7	Provision for maintainability		-
	When designing a machine,the following maintainability factors shall be taken into account:		-
	-accessibility,taking into account the environment and the human boby measurements,including the dimensions of the working clothes and tools used;	These factors have been taken into account during design.	Pass
	-ease of handling,taking into account human capabilities;	These factors have been taken into account during design.	Pass
	-limitation of the number of special tools and equipment;	These factors have been taken into account during design.	Pass
6.2.8	Observing ergonomic principles	-	-
	Ergonomic principles shall be taken into account in designing machinery to reduce mental or physical stress and strain of the operator.	Appropriate ergonomic principles have been taken into account in designing machinery	Pass
	These principles shall be considered when allocating functions to operator and machine(degree of automation) in the basic design.	These principles have been taken into account during allocating functions to operator and machine.	Pass
	Account shall be taken of body sizes likely to be found in the intended user population, strengths and postures, movement amplitudes, frequency of cyclic actions (see ISO 10075 and ISO 10075-2)	All these factors have been taken into account during design.	Pass
	All elements of the “operator-machine” interface such as controls, signaling or data display elements, shall be designed to easily understood so that clear and unambiguous interaction between the operator and the machine is possible.(see EN 614-1, ISO 6385, EN 13861 and IEC 61310-1)	All arrangement and design of manual controls have been checked in compliance with.	Pass

	Designer's attention is especially drawn to following ergonomic aspects of machine design		-
	a)Avoiding stressful postures and movements during use of the machine(e.g.by providing facilities to adjust the machine to suit the various operators).	Stressful postures and movements during use of the machine have been avoided.	Pass
	b) Designing machines, and more especially hand-held and mobile machines to enable them to be operated easily taking into account human effort, actuation of controls and hand, arm and leg anatomy.	This machine has been adjusted to the human strength and convenient movement.	Pass
	c) Limit as far as possible noise, vibration and thermal effects such as extreme temperatue	This machine with low noise, low vibration.	Pass
	d) Avoid linking the operator's working rhythm to an automatic succession of cycles.	This situation has been avoided.	Pass
	e) Providing local lighting on or in the machine for the illumination of the working area and of adjusting, setting-up, and frequent maintenance zones when the design features of the machine and/or its guards render the ambient lighting inadequate. Flicker, dazzling, shadows and stroboscopic effects shall be avoided if they can cause a risk. If the position of the lighting source has to be adjusted, its location shall be such that it does not cause any risk to persons making the adjustment.		Not applicable
	f) Select, locate and identify manual controls(actuators) so that		-
	- they are clearly visible and identifiable and appropriately marked where necessary(see 6.4.4)	All design and arrangement are compliance with this requirement.	Pass
	- they can be safely operated without hesitation or loss of time and without ambiguity(e.g. a standard layout of controls reduces the possibility of error when an operator changes from a machine to another one of similar type having the same pattern of operation)	All design and arrangement of the control logic have been checked in compliance with this requirement.	Pass
	-their location(for push-buttons) and their movement (for levers and handwheels) are consistent with their effect (see IEC 61310-3)	All the function has been checked in compliance with this requirement.	Pass
	Where a control is designed and constructed to perform several different actions, namely where there is no one-to-one correspondence (e.g. keyboards), the action to be performed shall be clearly displayed and subject to confirmation where necessary.		Not applicable
	Controls shall be so arranged that their layout, travel and resistance to operation are compatible with the action to be performed, taking account of ergonomic principles.	All the arrangement of the control logic have been checked in compliance with this requirement	Pass

	Constraints due to the necessary or foreseeable use of personal protective equipment(such as footwear, gloves)shall be taken into account.	There factors have been taken into account during design.	Pass
	g)Select, design and locate indicators, dials and visual display units so that		-
	-they fit within the parameters and characteristics of human perception		Pass
	-information displayed can be detected, identified and interpreted conveniently, i.e. long lasting, distinct, unambiguous and understandable with respect to the operator's requirements and the intended use;	All the information displayed comply with this requirement	Pass
	-the operator is able to perceive them form the control position		Pass
6.2.9	Preventing electrical hazard		-
	For the design of the electrical equipment of machines IEC 60201-1 gives general provisions, especially in clause 6 for protection against electric shock.	Please also make reference to EN 60204-1 test report.	Pass
	For requirements related to specific machines, see corresponding IEC standards(e.g. series of IEC 61029, IEC 60745, IEC 60335).		Not applicable
6.2.10	Preventing and hydraulic hazards		-
	Pneumatic and hydraulic equipment of machinery shall be designed so that:		-
	-the maximum rated pressure cannot be exceeded in the circuits(e.g. by means of pressure limiting devices)	Appropriate limiting devices have been provided.	Pass
	-no hazard results from pressure surges or rises, pressure losses or drops or losses of vacuum;	No such hazards exist.	Pass
	-no hazardous fluid jet or sudden hazardous movement of the hose (whiplash)results from leakage or component failures;		Not applicable
	-air receivers, air reservoirs or similar vessels(e.g. in gas loaded accumulators)comply with the design rules for these elements;	The devices are designed appropriately.	Pass
	-air elements of the equipment, and especially pipes and hoses, be protected against harmful external effects;	The pipes have been protected by appropriated devices.	Pass
	-as far as possible, reservoirs and similar vessels (e.g. in gas loaded accumulators)are automatically depressurized when isolating the machine from its power supply (see 6.3.5.4) and, if it is not possible, means are provided for their isolation, local depressurizing and pressure indication (see also ISO 14118, clause 5)	This requirement is complied with	Pass

	- all elements which remain under pressure after isolation of machine from its power supply be provided with clearly identified exhaust devices, and a warning label drawing attention to the necessity of depressurizing those elements before any setting or maintenance activity on the machine. See also ISO 4413 and ISO 4414	This requirement is complied with by appropriate design.	Pass
6.2.11	Applying inherently safe design measures to control system		-
6.2.11.1	General		-
	The design measures of the control system shall be chosen so that their safety-related performance privides a sufficient amount of risk reduction (see ISO 13849-1 or IEC 62061)	Inherently safe design measures to control system have applied.	Pass
	The correct measures of the control systems can avoid unforeseen and potentially hazardous machine behaviour.	Inherently safe Design measures to control system have applied.	Pass
	-an unsuitable design or modification (accidental or deliberate) of the control system logic;	No this kind of hazard in this machine	Pass
	- a temporary or permanent defect or a failure of one or several components of the control system;		Pass
	- a variation or a failure in the power supply of the control system;	No this kind of hazard in this machine.	Pass
	- inappropriate selection, design and location of the control devices;	No this kind of hazard in this machine.	Not applicable
	Typical examples of hazardous machine behaviour are:		-
	- unintended/unexpected start-up (see ISO 14188)	No this kind of hazard.	Pass
	- uncontrolled speed change;	No this kind of hazard.	Pass
	- failure to stop moving parts;	No this kind of hazard.	Pass
	- dropping or ejection of a mobile part of the machine or of a workpiece clamped by the machine;	No this kind of hazard.	Pass
	- machine action resulting from inhibition (defeating or failure) of protective devices	No this kind of hazard.	Pass
	In order to prevent hazardoues machine behaviour and to achieve safety functions, the design of control systems shall comply with the principles and methods presented in this subclause 6.2.11 and in 6.2.12.	The design of control systems comply with the related principles and methods	Pass
	These principles and methods shall be applied singly or in combination as appropriate to the circumstances (see ISO 13849-1 and EN 60204-1 and IEC 62061).	Please see the related clause.	Pass
	Control systems shall be designed to enable the operator to interact with the machine safely and easily; this requires one or several of the following solutions;		-

	-systematic analysis of start and stop conditions;	Systematic analysis have been applied.	Pass
	-provision for specific operating modes (e.g. start-up after normal stop. restart after cycle interruption or after emergency stop. removal of the workpieces contained in the machine, operation of a part of the machine in case of a failure of a machine element)	Enough provisions have been provided.	Pass
	-clear display of the faults;		Pass
	-measures to prevent accidental generation of unexpected start commands (e.g. shrouded start device) likely to cause dangerous machine behaviour (see ISO 14118 figure 1)	Main switch with lock and related devices are provided.	Pass
	-maintained stop commands (e.g. interlock) to prevent restarting that could result in dangerous machine behaviour (see ISO 14118:2000,figure 1)	This requirement is complied with.	Pass
	An assembly of machines may be divided into several zones for emergency stopping, for stopping as a result of protective devices and/or for isolation and energy dissipation.		Not applicable
	The different zones shall be clearly defined and it shall be obvious which parts of the machine belong to which zone.		Not applicable
	Likewise it shall be obvious which control devices (e.g. emergency stop devices, supply disconnecting devices) and/or protective devices belong to which zone.		Not applicable
	The interfaces between zones shall be designed such that no function in one zone creates hazards in another zone which has been stopped for an intervention.		Not applicable
	Control systems shall be designed to limit the movements of parts of the machinery, the machine itself, or workpieces and/or loads held by the machinery, to the safe design parameters (e.g. range, speed, acceleration, deceleration, load capacity). Allowance shall be made for dynamic effects (e.g. the swinging of loads).		Not applicable
	For example:		-
	-the traveling speed of mobile pedestrian controlled machinery other than remote-controlled shall be compatible with walking speed.		Not applicable
	-the range, speed, acceleration and deceleration of movements of the person-carrier and carrying vehicle for lifting persons shall be limited to non-hazardous values, taking into account the total reaction time of the operator and the machine.		Not applicable
	-the range of movements of parts of machinery for lifting loads shall be kept within specified limits.		Not applicable

	When machinery is designed to use synchronously different elements which can also be used independently the control system shall be designed to prevent risks due to lack of synchronization.		Not applicable
6.211.2	Starting of internal power source/switching on an external power supply.		-
	The starting of an internal power source or switching-on of an external power supply shall not result in a hazardous situation. For example: -starting the internal combustion engine shall not lead to movement of a mobile machine; -connection to mains electricity supply shall not result in the starting of working parts of a machine. See EN 60204-1, 7.5 (see also Annexes A and B).	Please also make reference to EN 60204-1 test report.	Pass
6.2.11.3	Starting/stopping of a mechanism		-
	The primary action for starting or accelerating the movement of a mechanism should be performed by passage from state 0 to state 1(if state 1 represents the highest energy state)	This requirement has been taken into account during design.	Pass
	The primary action for stopping or slowing down should be performed by removal or reduction of voltage or fluid pressure, or, if binary logic elements are considered, by passage from state 1 to 0 (if state 1 represents the highest energy state).	The type of stopping of this machine belongs to state 1and state 0.	Pass
	When, in order for the operator to maintain permanent control of deceleration, this principle not observed(e.g. a hydraulic braking vice of a self-propelled mobile machine),the machine shall be equipped with a means of slowing and stopping in case of failure of the main braking system	No such situation exist.	Pass
6.2.11.4	Restart after power interruption		-
	If it may generate a hazard,the spontaneous restart of a machine when it is re—energized alter power interruption shall be prevented (e.g. by use of a self-maintained relay, contactor or valve).	The spontaneous restart of amachine when it is re-energized after power interruption has been prevented by contactor.	Pass
6.2.11.5	Interruption of power supply situations resulting from interruption or excessive fluctuation of the power supply. At least the following requirements shall be met:	Machinery shall be designed to prevent hazardous	Pass
	-the stopping function of the machinery shall remain；		Pass
	-all devices whose permanent operation is required for safety shall operation an effective way to maintain safety(e.g. locking, clamping devices,cooling or heating devices, power-assisted steering of self-propelled mobile machinery);		Pass

	-parts of machinery or workpieces and/or loads held by machinery which are liable to move as a result of potential energy shall be retained for the time necessary to allow them to be safely lowered	No such situation exists.	Pass
6.2.11.6	Use of automatic monitoring		-
	Automatic monitoring is intended to ensure that a safety function(s) implemented by a protective measure do(es) not fail to be performed if the ability of a component or an element to perform its function is diminished ,or if the process conditions are	Appropriate automatic monitoring has been used.	Pass
	Automatic monitoring either detects a fault immediately or carries out periodic checks so that a fault is detected before the next demand upon the safety function.	Appropriate automatic monitoring has been used	Pass
	In either case, the protective measure can be initiated immediately or delayed until a specific event occurs (e.g. the beginning of the machine cycle) The protective measures may be, e.g.:	Appropriate automatic monitoring has been used.	Pass
	-the stopping of the hazardous process；	Emergency stop is provided	Pass
	-preventing the re-start of this process after the first stop following the failure;	Reset before restart is necessary	Pass
	-the triggering of an alarm		Not applicable
6.2.11.7	Safety functions implemented by programmable electronic control systems		Pass
6.2.11.7.1	General		Pass
	A control system including programmable electronic equipment(e.g. programmable controllers)can be used to implement safety functions machinery		Pass
	equipment(e.g. programmable controllers) can be used to implement safety functions machinery	safety functions are considered during design	Pass
	The design of the programmable electronic control system shall be such that the probability of random hardware failures and the likelihood of systematic failures that can adversely affect the performance of the safety—related control function(s)are sufficiently low	safety functions are considered during design	Pass
	Where a programmable electronic control system performs a monitoring function, the system behaviour on detection of a fault shall be considered(see also IEC 6I 508 series for further guidance)	satisfied this	Pass
	The programmable electronic control system should be installed and validated to ensure that the specified performance(e.g. safety integrity level(SIL)in IEC 6I 508 series)for each safety function has been achieved	it be installed and validated to ensure that the specified performance	Pass

	Validation comprises testing an analysis(e.g. static,dynamic or failure analysis)to show that all parts interact correctly to perform the safety function and that unintended functions do not occur	All parts interact correctly to perform the safety function and that unintended functions do not occur	Pass
6.2.11.7.2	Hardware aspects		-
	The hardware(including e.g. sensors, actuators,logic solvers)shall be selected (and/or designed)and installed to meet both the functional and performance requirements of the safety function(s)to be performed, in particular,by means of:	The hardware has been selected and installed to meet both the functional and performance requirements of the safety functions to be performed	Pass
	-architectural constraints(e.g. the configuration of the system, its ability to tolerate faults，its behaviour on detection of a fault)：	Appropriate devices are provided	Pass
	-selecting (and/or designing) equipment and devices with an appropriate probability of dangerous random hardware failure;	Appropriate devices are provided	Pass
	Incorporating measures and techniques within the hardware to avoid systematic failures and control systematic faults.	Appropriate devices are provided.	Pass
6.2.11.7.3	Software aspects		-
	The software (incfuding internal operating software(or system sofiware) and application software) shall be designed so as to satisfy the performance specification for the safety functions (see also IEC 61508-3)	It has PLC.	Pass
	Application software		-
	Application software should not be re-programmable by the user.	Not applicable	Not applicable
	This may be achieved by use of embedded software in a non re-programmable memory (e.g. micro-controller, application specific integrated circuit (ASIC)	Not applicable	Not applicable
	When the application requires reprogramming by the user, the access o the software dealing with safety functions should be restricted e.g. by : -locks; -passwords for the authorized persons		Not applicable
6.2.11.8	Principles relating to manuai control		-
	a)Manual control devices shall be designed and Iocated according to the relevant ergonomic principles given in 6.2.8	Manual control devices have been designed and Iocated according to the relevant ergonomic principles given in 4.8.7	Pass
	b)A stop control device shall be placed near each start control device. Where the start /stop function is performed by means of a hold-to-run control, a separate stop control device shali be provided when a risk can result from the hold-to-run control device failing to deliver a stop command when released.	A stop control device has been placed near each start control device.	Pass

	c) Manual controls shall be located out of reach of the danger zones (see IEC 61310-3), except for certain controls where, of necessity, they are located within a danger zone, such as emergency stop or teach pendant.	Manual controls have been located out of reach of the danger zones.	Pass
	d)Whhenever possible. control devices and control positions shall be located so that the operator is able to observe the working area or hazard zone.	The control devices and control positions have been located so that the operator is able to observe the working area or hazard zone.	Pass
	The driver of a ride-on mobile machine shall be able to actuate all control devices required to operate the machine from the driving position, except for functions which can be controlled more safely from other positions.		Not applicable
	On machinery intended for lifting persons, controls for lifting and lowering and, if appropriate, for moving the carrier, shall generally be located in the carrier. If safe operation requires controls to be situated outside the carrier, the operator in the carrier shall be provided with the means of preventing hazardous movements.		Not applicable
	e) if it is possible to start the same hazardous element by means of several controls, the control circuit shall be so arranged that only one control is effective at a given time. This applies especially to machines which can be manually controlled unit (teach pendant, for instance), with which the operator may enter danger zones.		Not applicable
	f) Control actuators shall be designed or guarded so that their effect, where a risk is involved, cannot occur without intentional operation (see ISO 9355-1 and ISO 447)	This requirement is complied with.	Pass
	g) For machine functions whose safe operation depends on permanent, direct control by the operator, measures shall be taken to ensure the presence of the operator at the control position, e.g. by the design and location of control devices.	This requirement is complied with.	Pass
	g) For machine functions whose safe operation depends on permanent, direct control by the operator, measures shall be taken to ensure the presence of the operator at the control position, e.g. by the design and location of control devices.	This requirement is complied with.	Pass
	h) For cableless control an automatic stop shall be performed when correct control signals are not received, including loss of communication(see EN 60204-1)		Not applicable
6.2.11.9	Control mode for setting, teaching, process changeover, fault-finding, cleaning or maintenance		Not applicable

	Where, for setting, teaching, process changeover, fault-finding, cleaning or maintenance of machinery, a guard has to displaced or removed and /or a protective device has to be disabled, and where it is necessary for the purpose of these operations for the machinery or part of the machinery to be put in operation, safety of the operator shall be achieved using a specific control mode which simultaneously:		Not applicable
	-disables all other control modes;		Not applicable
	-permits operation of the hazardous elements only by continuous actuation of an enabling device, a hold-to-run control device or a two –hand control device;		Not applicable
	-permits operation of the hazardous elements only in reduced risk conditions (e.g. reduced speed, reduced power/force, step-operation, e. g. with a limited movement control device)		Not applicable
	Prevents any operation of hazardous functions by voluntary or involuntary action on the machine's sensors.		Not applicable
	This control mode shall be associated with one or more of following measures:		Not applicable
	-restriction of access to the danger zone as far as possible.		Not applicable
	-emergency stop control within immediate reach of the operator;		Not applicable
	Portable control unit(teach pendant)and/or local controls allowing sight of the controlled elements.(see IEC60204-1:9.2.4)		Not applicable
6.2.11.10	Selection of control and operating modes		-
	If machinery has been designed and built to allow for its use in several control or operating modes requiring different protective measures and /or work procedures(e.g. to allow for adjustment, setting, maintenance, inspection),it shall be fitted with a mode selector which can be locked in each position.		Not applicable
	Each position of the selector shall be clearly identifiable and shall exclusively allow one control or operating mode.		Not applicable
	The selector may be replaced by another selection means which restricts the use of certain functions of the machinery to certain categories of operators(e.g. access codes for certain numerically controlled functions).		Not applicable
6.211.11	Applying measures achieve electromagnetic Compatibility		-
	For guidance on electromagnetic compatibility, see IEC60204-1, and IEC61000-6 series		Not applicable
6.2.11.12	Provision of diagnostic systems to aid fault-finding		-

	Diagnostic systems to aid fault finding should be included in the control system so that there is no need to disable any protective measures		Not applicable
6.2.12	Minimizing the probability of failure of safety functions		-
6.2.12.1	General		-
	Safety of machinery is not only dependent on the reliability of the control systems but also on the reliability of all parts of the machine. The continued operation of the safety functions is essential for the safe use of the machine. This can be achieved by:		Pass
6.2.12.2	Use of reliable components		-
	“Reliable component”means components which are capable of withstanding all disturbances and stresses associated with the usage of the equipment in the conditions of intended use (including the environmental conditions),for the period of time or the probability of operations fixed for the use, with a low probability of failures generating a hazardous malfunctioning of the machine. Components shall be selected taking into account all factors mentioned above(see also 6.213	Reliable components have been used	Pass
6.2.12.3	Use of“oriented failure mode”components		-
	“Oriented failure mode”components or systems are those in which the predominant failure mode is known in advance and which can be used so that such a failure leads to a non-hazardous alteration of the machine function		Not applicable
	The use of such components should always be considered particularly in cases where redundancy is (see 6.2.12.4)not employed		Not applicable
6.2.12.4	Duplication(or redundancy)of components or subsystems		Not applicable
	In the design of safety-related parts of the machine, duplication(or redundancy) of components may be used so that if one component fails, another component(or other components) continue(s) to perform its(their) function, thereby ensuring that the safety function remains available		Not applicable
	In order to allow the proper action to be initiated, omponent failure shall be preferably detected by automatic monitoring (see 6.2.1 1.6) or in some circumstances by regular inspection,		Not applicable
	provided that the inspection interval is shorter than the expected lifetime of the components.		Not applicable
	Diversity of design and/or technology can be used to avoid common cause failures (e.g. from electromagnetic disturbance) or common mode failures.		Not applicable

6.2.13	Limiting exposure to hazards through reliability of quipment		-
	Increased reliability of all component parts of machinery reduces the frequency of incidents requiring rectification, thereby reducing exposure to hazards.	This requirement is complied with.	Pass
	This applies to power systems (operative part) as well as to control systems, to safety functions as well as to other functions of machinery.	This requirement is complied with.	Pass
	Safety-critical components (as e.g. certain sensors) with known reliability shall be used.	Safety-critical components are used in this machine.	Pass
	The elements of guards and of protective services shall be particularly reliable, as their failure can expose persons to hazards, and also as poor reliability would encourage attempts to defeat them.	This requirement is complied with.	Pass
6.2.14	Limiting exposure to hazards through mechanization or automation of loading(feeding) /unloading (removal) operations		-
	Mechanization and automation of machine loading/unloading operations and more generally of handling operations (of work pieces, materials, substances) limit the risk generated by these operations by reducing the exposure of persons to hazards at the operating points.	This requirement is complied with.	Pass
	Automation can be achieved e.g. by robots, handling devices. transfer mechanisms, air blast equipment.	This requirement has been complied with by design.	Pass
	Mechanization can be achieved, e.g. by feeding slides, push rods, hand-operated indexing tables.	This requirement has been complied with by design.	Pass
	While automatic feeding and removal devices have much to offer in preventing accidents to machine operators, they can create danger when any faults are being rectified.	Appropriate provisions have been provided.	Pass
	Care shall be taken to ensure that the use of these devices does not introduce further hazards (e.g. trapping, crushing) between the devices and parts of the machine or workpieces/materials being processed.	These devices will not introduce further hazards	Pass
	Suitable safeguards (see 6.3) shall be provided if this cannot be ensured.	Please see the related clause	Pass
	Automatic feeding and removal devices with their own control systems and the control systems of the associated machine shall be interconnected after thoroughly studying how all safety functions are performed in all control and operation modes of the whole equipment.	This requirement has been complied with by design	Pass
6.2.15	Limiting exposure to hazards through location of the setting and maintenance points outside of danger zones.		Pass

	The need for access to danger zones shall be minimized by locating maintenance, lubrication and setting points outside these zones.	This requirement has been complied with by design.	Pass
6.3	Safeguarding and complementary protective measures		-
6.3.1	General		-
	Guards and protective devices shall be used to protect persons whenever inherently safe design does not reasonably make it possible either to remove hazards or to sufliciently reduce risks. Complementary protective measures involving additional equipment (e.g. emergency stop equipment)may have to be implemented.	Appropriate guards and protective devices have been used to protect persons whenever inherently safe design does not reasonably make it possible either inherently safe either to remove hazards or to sufficiently reduce risks.	Pass
	The different kinds of' guards and protective devices are defined in 3.27 and 3.28.	Please see the related clause	Pass
	Certain safeguards may be used to avoid exposure to more than one hazard (e.g. a fixed guard preventing access to a zone where a mechanical hazard is present being used to reduce noise level and collect toxic emissions)	Such safeguards exist	Pass
6.3.2	Selection and implementation of guards and protective devices		-
6.3.2.1	General		-
	This subclause gives guidelines for the selection and the implementation of guards and protective devices the primary purpose of which is to protect persons against hazard generated by moving parts, according to the nature of those parts(see figure 4)and to the need for access to the danger zone(s)	Please see the related clause	Pass
	The exact choice of a safeguard for a particular machine shall be made on the basis of the risk assessment for that machine	Please see the related clause.	Pass
	In selecting an appropriate safeguard for a particular type of machinery or hazard zone, it shall be borne in mind that a fixed guard is simple and shall be used where access of an operation (operation without any malfunction) of the machinery.		Pass
	As the need for frequency of access increase this inevitably leads to the fixed guard not being replaced	This requirement is complied with	Pass
	This requires the use of an alternative protective measure (movable interlocking guard, sensitive protective equipment.)	Movable interlocking guard is used.	Pass

	A combination of safeguards may sometimes be required. For example, where, in conjunction with a fixed guard, a mechanical loading(feeding) device is used to feed a workpiece into a machine, thereby removing the need for assess to the primary hazard zone, a trip device may be requiring hazard between the secondary drawing-in or shearing hazard between the mechanical loading(feeding) device, when reachable, and the fixed guard.		Not applicable
	Consideration shall be given enclosure of control positions or intervention zones to provide combined protection against several hazards which may include:	This requirement has been taken into consideration.	Pass
	- hazards from falling or ejected objects(e.g. falling object protection structure)	No such hazards exist in this machine.	Pass
	- emission hazards(e.g. protection against noise, vibration, radiation , harmful substances)	No such hazards exist in this machine.	Pass
	- hazards due to the environment(e.g. protection against heat, cold, foul weather)	No such hazards exist in this machine.	Pass
	- hazards due to tipping over or rolling over of machinery(e.g. roll-over or tip-over protection structure)	No such hazards exist in this machine.	Pass
	The design of such enclosed work stations(e.g. cabs and cabins) shall take into account ergonomic principles concerning visibility,lighting, atmospheric conditions, access, posture.	No such hazards exist in this machine.	Pass
6.3.2.2	Where access to the hazard zone is not required during normal operation		-
	Where access to the hazard zone is not required during normal operation of the machinery, safeguard should be selected fiom the following:		-
	a) fixed guard (see also ISO 14120)	Fixed guards are provided.	Pass
	b) interlocking guard with or without guard locking (see also 6.3.3.2.3, ISO 14119, ISO 14120);	Provided.	Pass
	c) self-closing guard (see ISO 14120, 3.3.2)		Not applicable
	d) sensitive protective equipment, e.g. electro-sensitive protective equipment (see IEC 61496) or pressure sensitive mat (see ISO 13856)		Not applicable
6.3.2.3	Where access to the hazard zone is required during normal operation		-
	Where access to the hazard zone is required during normal operation of the machinery , safeguards should be selected fiom the following:		-
	a)interlocking guard with or without guard locking (see also ISO 14119, ISO 14120 and 6.3.3.2.3 of this standard);		Not appficable.

	b)sensitive protective equipment, e.g electro-sensitive protective equipment (see IEC 61496)		Not applicable
	c)two-hand control device (see ISO 13851)		Not applicable
6.3.2.4	Where access to the hazard zone is required for machine setting, teaching, process changeover, fault finding, cleaning or maintenance.		-
	As far as possible, machines shall be designed so that the safeguards provided for the protection of the production operator may ensure also the protection of personnel in charge of setting, teaching, process Changeover, fault finding, cleaning or maintenance without hindering them in performing their task.		Not applicable
	Such tasks shall be identified and considered in the risk assessment as parts of the use of the machine (see 5.2)		Not applicable
6.3.2.5	Selection and implementation of sensitive protective equipment		-
6.3.2.5.1	Setection		-
	Due to the great diversity ofthe technologies on which their detection function is based, all types of sensitive protective equipment are far from being equally suitable for safety applications.		Not applicable
	The following provisions are intended to provide the designer with criteria for selecting , for each application, the most suitable device(s).		Not applicable
	Types of sensitive protective equipment include, e.g.:		-
	- light curtains;		Not applicable
	- scanning devices as, e.g. laser scanners;		Not applicable
	- pressure sensitive mats;		Not applicable
	- trip bars, trip wires.		Not applicable
	Sensitive protective equipment can be used:		-
	- for tripping purposes;		Not applicable
	- for presence sensing;		Not applicable
	- for both tripping and presence sensing		Not applicable
	- to re-initiate machine operation, a practice which is subject to stringent conditions.		Not applicable
	The following characteristics of the machinery, among others, can preclude the sole use of sensitive protective equipment:		Not applicable
	- tendency for the machinery to eject materials or component parts;		Not applicable
	- necessity to guard against emissions (noise, radiation, dust, etc.)		Not applicable
	- erratic or excessive machine stopping time;		Not applicable
	-inability of a machine to stop part-way through a cycle.		Not applicable
6.3.2.5.2	Implementation		-
	consideration should be given to :		-

	a) size, characteristics and positioning of the detection zone (see ISO 13855, which deals with the positioning of some types of sensitive protective equipment)		Not applicable
	b)reaction of the device to fault conditions (see IEC 61496 for electro-sensitive protective equipment)		Not applicable

	c)possibility of circumvention		Not applicable
	d)detection capability and its variation over the course of time (e.g. as a result of its susceptibility to different environmental conditions such as the presence of reflecting surfaces, other artificial light sources, sunlight or impurities in the air.		Not applicable
	sensitive protective equipment shall be integrated in the operative part and associated with the control system of the machine so that :		-
	- a command is given as soon as a person or part of a person is detected ;		Not applicable
	- the withdrawal of the person or part of a person detected does not, by itself, restart the hazardous machine function(s);therefore, the command given by the sensitive protective equipment shall be maintained by the control system until a new command is given ;		Not applicable
	- restarting the hazardous machine function(s) results from the voluntary actuation , by the operator, of a control device placed outside the hazard zone , where this zone can be observed by the operator ;		Not applicable
	-the machine cannot operate during interruption of the detection function of the sensitive protective equipment,except during muting phases ;		Not applicable
	- the position and the shape of detection field prevents,possibly together with fixed guards , a person or part of a person from entering the hazard zone ,or being present in it , without being detected .		Not applicable
6.3.2.5.3	Additional requirements for sensitive protective equipment when used for cycle initiation .		-

	In this exceptional application, starting of the machine cycle is initiated by the withdrawal of a person or of the detected part of a person from the sensing field of the sensitive protective equipment , without any additional start command , hence deviating from the general requirement given in the second point of the dashed list in 6.3.2.5.2, above .After switching on the power supply ,or when the machine has been stopped by the tripping function of the sensitive protective equipment , the machine cycle shall be initiated only by voluntary actuation of a start control .		Not applicable
	Cycle initiation by sensitive protective equipment shall be subject to the following conditions :		-
	a)only active optoelectronic protective devices (AOPDs) complying with IEC 61496 series shall be used ;		Not applicable
	b) the requirements for an AOPD used as a tripping and presence-sensing device (see IEC 61496) are satisfied -in particular, location, minimum distance (see ISO 13855),detection capability, reliability and monitoring of control and braking systems;		Not applicable
	c) the cycle time of machine is short and the facility to re-initiate the machine upon clearing of the sensing field is limited to a period commensurate with a single normal cycle;		Not applicable
	d) entering the sensing field of the AOPD(s) or opening interlocking guards is the only way to enter the hazard zone;		Not applicable
	e) if there is more than one AOPD safeguarding the machine, only one of the AOPD(s) is capable of cycle re-initiation;		Not applicable
	f) with regard to the higher risk resulting from automatic cycle initiation, the AOPD and the associated control system comply with a higher safety-related performance than under normal conditions.		Not applicable
6.3.2.6	Protective measures for stability		-
	If stability cannot be achieved by inherently safe design measures such as weight distribution(see 4.6), it will be necessary to maintain it by protective measures such as the use of :		-
	- anchorage bolts;		Pass
	- locking devices		Not applicable
	- movement limiters or mechanical stops;		Not applicable
	- acceleration or deceleration limiters;		Not applicable
	- load limiters;		Not applicable
	- alarms warning of the approach to stability or tipping limits;		Not applicable
6.3.2.7	Other protective devices		-

	When a machine requires continuous control by the operator(e. g. mobile machines, cranes) and an error of the operator can generate a hazardous situation, this machine shall be equipped with the necessary devices to enable the operation to remain within specified limits, in particular		Not applicable
	- when the operator has insufficient visibility of the hazard zone;		Not applicable
	- when the operator lacks knowledge of the actual value of a safety-related parameter (e. g. a distance, a speed, the mass of a load, the angle of a slope)		Not applicable
	-when hazards may result form operation other then		Not applicable
	those controlled by the operator;		-
	The necessary devices include:		-
	- devices for limiting parameters of movement (distance, angle, velocity , acceleration)		Not applicable
	- overloading and moment limiting devices:		Not applicable
	- devices to prevent collisions or interference with other machines;		Not applicable
	-device for preventing hazards to pedestrian operators of mobile machinery or other pedestrians:		Not applicable
	- torque limiting devices, breakage points to prevent excessive stress of components and assemblies;		Not applicable
	- devices for limiting pressure. temperature;		Not applicable
	- devices for monitoring emissions;		Not applicable
	- devices prevent operation in the absence of the operator at the control position;		Not applicable
	- device to prevent lifting operations unless stabilizers are in place;		Not applicable
	- devices to ensure that components are in a safe position before traveling;		Not applicable
	Automatic protective measures triggered by such devices which take operation of the machinery out of the control of the operator (e.g. automatic stop of hazardous movement) should be preceded or accompanied by a warning signal to enable the operator to take appropriate action (see 6.4.3)		Not applicable
6.3.3	Requirements for the design of guards and protective devices		-
6.3.3.1	General requirements		-
	Guards and protective devices shall be designed to be suitable for the intended use taking into account mechanical and other hazards involved. Guards and protective devices shall be compatible with the working environment of the machine and designed so that they cannot be easily defeated. They shall provide the minimum possible interference with activities during operation and other phases of machine life, in order to reduce any incentive to defeat them.	Guards and protective devices have been appropriately designed.	Pass

	Guards and protective devices shall :		-
	- be of robust construction.	This requirement has been taken into account during design.	Pass
	- not give rise to any additional hazard;	This requirement has been taken into account during design.	Pass
	-not be easy to by-pass or render non-operational;	This requirement has been taken into account during design.	Pass
	-be located at an adequate distance from the danger zone (see ISO 13857 and ISO 13855).	This requirement has been taken into account during design.	Pass
	-cause minimum obstruction to the view of the production process:	This requirement has been taken into account during design.	Pass
	-enable essential work to be carried out on installation and/or replacement of tools and also for maintenance by allowing access only to the area where the work has to be done, if possible without the guard or protective device having to be moved;	This requirement has been taken into account during design.	Pass
	For openings in the guards see ISO 13857	This requirement has been taken into account during design.	Pass
6.3.3.2	Requirements for fixed guards		-
6.3.3.2.1	Functions of guards		-
	The functions that guards can achieve are:	These functions are achieved by fixed guards.	Pass
	-prevention of access to the space enclosed by guard and/or . -containment/capture of materials, workpieces, chips, liquids which may be ejected or dropped by the machine and reduction of emissions(noise, radiation, hazardous substances such as dust, fumes, gases)which may be generated by the machine.	These functions are achieved by fixed guards.	Pass
	Additionally, they may need to have particular propertied relating to electricity, temperature, fire, explosion, vibration. visibility(see ISO 14120) and operator position ergonomics(e.g. usability, operator's movements, posture, repetitive movements).	These functions are achieved by fixed guards.	Pass
6.3.3.2.2	Requirements for fixed guards		-
	Fixed guards shall be securely held in place:		-
	- either permanently (e.g. by welding) -or by means of fasteners (screws, nuts) making removal/opening impossible without using tools; they should not remain closed without their fasteners (see ISO 14120)	All the fixed guards are securely held in place by appropriate fasteners.	Pass
6.3.3.2.3	Requirements for movable guards		-
	a)movable guards which provide protection against hazards generated by moving transmission parts shall:		-

	-as far as possible remain fixed to the machinery or other structure (generally by means of hinges or guides) when open;	Gemels are used for the movable guards.	Pass
	-be interlocking guards (with guard locking when necessary) (see ISO 14119)		Not applicable
	b) movable guards against hazards generated by non-transmission moving parts shall be designed and associated with the machine control system so that;		-
	- moving parts cannot start up while they are within the operator's reach and the operator cannot reach moving parts once they have start up; this can be achieved by interlocking guards, with guard locking when necessary.	Interlocking guards are provided to comply with these requirements.	Pass
	- they can be adjusted only by an intentional action, such as the use of tool or a key;	This requirement is complied with.	Pass
	-they absence or failure of one of their components prevents starting of the moving parts or stops them; this can be achieved by automatic monitoring (see 4.11.6)	This requirement is complied with.	Pass
6.3.3.2.4	Requirements for adjustable guards		–
	Adjustable guards may only be used where the hazard zone cannot for operational reasons be completely enclosed;		Not applicable
	They shall:		–
	-be designed so that the adjustment remains fixed during a given operation		Not applicable
	-be readily adjustable without the use of tools;		Not applicable
6.3.3.2.5	Requirements for interlocking guards with a start function (control guards)		Not applicable
	An interlocking guard with a start function may be used provided that		Not applicable
	- all requirements for interlocking guards are satisfied (see ISO 14119)		Not applicable
	- the cycle time of the machine is short		Not applicable
	-the maximum opening time of the guard is present to a low value (e.g. equal to the cycle time). When this time is exceeded, the hazardous function(s) cannot be initiated by the closing of the interlocking guard with a tart function and resetting is necessary before restarting the machine.		Not applicable
	- the dimensions or shape of the machine do not allow a person, or part of a person, to stay in the hazard zone or between the hazard zone and the guard while the guard is closed (see ISO 14120)		Not applicable
	- all other guards whether fixed (removable type) or movable are interlocking guards;		Not applicable
	-the interlocking device associated with the interlocking guard with a start function is designed in such a way – e.g. by duplication of position detectors and use of automatic monitoring (see 4.11.6)- that its failure cannot lead to an unintended/unexpected start-up;		Not applicable

	-the guard is securely held open(e.g. by a spring or counterweight)such that it cannot initiate a start while falling by its own weight;		Not applicable
6.3.3.2.6	Hazards from guards		-
	Care shall be taken to prevent hazards which might be generated by:		-
	- the guard construction (e.g. sharp edges or corners, material);	This requirement has been taken into account during design.	Pass
	- the movements of the guards (shearing or crushing zones generated by power-operated guards and by heavy guards which are liable to fall)	This requirement has been taken into account during design.	Pass
6.3.3.3	Technical characteristics of protective devices		-
	Protective devices shall be selected or designed and connected to the control system so as to ensure correct implementation of their safety function (s) is ensured.	This requirement has been taken into account during design.	Pass
	Protective devices shall be selected on the basis of their having met the appropriate product standard (for example, IEC 61496 for active optoelectronic protective devices) or shall be designed according to one or several of the principles formulated in ISO 13849-1 or IEC62061.	This requirement has been taken into account during design.	Pass
	Protective devices shall be installed and connected to the control system so that they cannot be easily defeated.	This requirement has been taken into account during design.	Pass
6.3.3.4	Provisions for alternative types of safeguards.	-	-
	Provisions should be made to facilitate the fitting of alternative types of safeguards on machinery where it is known that this fitting will be necessary because the work to be done on it will vary.		Not applicable
6.3.4	Safeguarding for reducing emissions		-
6.3.4.1	General		-
	If the measures for the reduction of emissions at source mentioned in 6.2.2.2 are not adequate, the machine shall be provided with additional protective measures (see 6.3.4.2 to 6.3.4.5).	No such hazard exists.	Pass
6.3.4.	Noise		-
	Additional protective measures include, for example: -enclosures (see ISO 15667) -screens fitted to the machine; -silencers (see ISO 14163)	No such hazard exists.	Pass
6.3.4.3	Vibration		-
	Additional protective measures include, for example, damping devices for vibration isolation between the source and the exposed person such as resilient mounting or suspended seats.	No such hazard exists.	Pass
	For measures for vibration isolation of stationary industrial machinery see EN 1299	No such hazard exists.	Pass
6.3.4.4	Hazardous substances		-

	Additional protective measures include, for example:		-
	-encapsulation of the machine (enclosure with negative pressure);		Not applicable
	- local exhaust ventilation with filtration.		Not applicable
	- wetting with liquids;		Not applicable
	- special ventilation in the area of the machine (air curtains , cabins for operators)		Not applicable
6.3.4.5	Radiation		-
	Additional protective measures include, for example:		-
	- use of filtering and absorption;		Not applicable
	- use of attenuating screens or guards		Not applicable
6.3.5	Complementary protective measures		-
6.3.5.1	General		-
	Protective measures which are neither inherently safe design measures, nor safeguarding (implementation of guards and/or protective devices),nor information for use may have to be implemented as required by the intended use and the reasonably foreseeable misuse of the machine. Such measures include, but are not limited to, the ones dealt with in 6.3.5.2 to 6.3.5.6	It meet the requirement.	Pass
6.3.5.2	Components and elements to achieve the emergency stop function		-
	If following a risk assessment, a machine needs to be fitted with components and elements to achieve an emergency stop function to enable actual or impending emergency situations to be averted, the following requirements apply:		-
	-the actuators shall be clearly identifiable, clearly visible and readily accessible	The actuators can be clearly identifiable, clearly visible and readily aessible	Pass
	-the hazardous process shall be stopped as quickly as possible without creating additional hazards. If this is not possible or the risk cannot be reduced, it should be questioned whether implementation of an emergency stop function is the best solution;	The hazardous process can be topped as quickly as possible without creating additional hazards	Pass
	-the emergency stop control shall trigger or permit the triggering of certain safeguard movements where necessary.	No this situation exists	Pass
	Once active operation of the emergency stop device has ceased following an emergency stop command, the effect of this command shall be sustained until it is rest.	Reset is necessary before re-start.	Pass
	This reset shall be possible only at that location where the emergency stop command has been initiated. The reset of the device shall not restart the machinery, but only permit restarting.	This requirement is complied with by appropriate design of the emergency stop	Pass

	More details for the design and selection of electrical components and elements to achieve the emergency stop function are provided in EN 60204 series.	Please see the related clauses.	Pass
6.3.5.3	Measures for the escape and rescue of trapped persons-		-
	Measures for the escape and rescue of trapped persons may consist e.g. of:		-
	-escape routes and shelters in installations generating operator-trapping hazards		Not applicable
	-arrangements for moving some elements by hand, after an emergency stop		Not applicable
	-arrangements for reversing the movement of some elements		Not applicable
	- anchorage points for descender devices;		Not applicable
	-means of communication to enable trapped operators to call for help		Not applicable
6.3.5.4	Measures for isolation and energy dissipation		-
	Especially with regard to their maintenance and repair, machines shall be equipped with the technical means to achieve the isolation from power supply(ies) and dissipation of stored energy as a result of following actions:		-
	a) isolating(disconnecting,separating)the machine(or defined parts of the machine) from all power supplies;	A main switch with lock is provided.	Pass
	b) locking (or otherwise securing) all the isolating units in the isolating position;	Please see the report for EN 60204	Pass
	dissipating or , if this is not possible or practicable, restraining (containing) any stored energy which may give rise to a hazard;	Please see the report for EN 60204	Pass
	verifying, by means of a safe working procedure, that the actions taken according to a), b) and c) above have produced the desired effect.	Please see the report for EN 60204	Pass
	See ISO 14118, clause 5 and EN 60204-1: 5.5 and 5.6		Pass
6.3.5.5	Provisions for easy and safe handling of machines and their heavy component parts		Pass
	Machines and their component parts which cannot be moved or transported by hand shall be provided or capable of being provided with suitable attachment devices for transport by means of lifting gear.	Appropriate attachments are provided.	Pass
	These attachments may be, among others,		Pass
	standardized lifting appliances with slings, hooks,eyebolts, or tapped holes for appliance fixing;		Pass
	appliances for automatic grabbing with a lifting hook when attachment is not possible from the ground.	Such devices are used.	Pass
	guiding grooves for machines to be transported by a fork truck;		Not applicable
	lifting gear and appliances integrated into the machine.		Not applicable

	Parts of machinery which can be removed manually in operation shall be provided with means for their safe removal and replacement; (See also 6.4.4c item 3).		Pass
6.3.5.6	Measures for safe access to machinery		-
	Machinery shall be so designed as to enable operation and all routine tasks relating to setting and/or maintenance, to be carried out,as far as possible, by a person remaining at ground level.	These requirements have been taken into account during design.	Pass
	Where this is not possible, machines shall have built-in platforms, stairs or other facilities to provide safe access for those tasks ,but care should be taken to ensure that such platforms or stairs do not give access to danger zones of machinery.		Not applicable
	The walking areas shall be made from materials which remain as slip resistant as practicable under working conditions and, depending on the height from the ground , suitable guard-rails(see ISO14122-3)shall be provided.		Not applicable
	In large automated installations, particular attention shall be given to safe means of access such as walkways, conveyor bridges or crossover points.		Not applicable
	Means of access to parts of machinery located at a height shall be provided with collective means of protection against falls(e.g. guard-rails for stairways, stepladders and platforms and/or safety cages for ladders)		Not applicable
	As necessary, anchorage points for personal protective equipment against falls from a height shall also be provided(e.g. in carriers of machinery for lifting persons or with elevating control stations)		Not applicable
	Openings shall whenever possible open towards a safe position, They shall be designed to prevent hazards due to unintended opening.		Not applicable
	The necessary aids for access shall be provided(e.g. steps, handholds).Control devices shall be designed and located to prevent their being used as aids for access.		Not applicable
	When machinery for lifting goods and/or persons includes landings at fixed levels, these shall be equipped with inter locking guards preventing falls when the platform is not present at the level.		Not applicable
	Movement of the lifting platform shall be prevented while the guards are open.		Not applicable
	For detailed provisions see ISO 14122.		Not applicable
	Information for use		-
6.4	General requirements		-
6.4.1	Drafting information for use is an integral part of the design of a machine(see figure2).	Please see the related clause.	Pass

6.4.1.1	Information of use consists of communication links, such as texts, words, signs, signals, symbols or diagrams, used separately or in combination to convey information to the user. It is directed to professional and/or non-professional users.	All the information is stated in the appropriate place.	Pass
6.4.1.2	Information shall be provided to the user about the intended use of the machine, taking into account, notably, all its operating modes.		-
	The information shall contain all directions required to ensure safe and correct use of the machine. With this in view, it shall inform and warn the user about residual risk.	All the information is stated in the appropriate place.	Pass
	The information shall indicate, as appropriate,		-
	- the need for training,	All the information is stated in the appropriate place.	Pass
	- the need for personal protective equipment,	All the information is stated in the appropriate place.	Pass
	- the possible need for additional guards devices (see Figure 2, Footnote d).	All the information is stated in the appropriate place.	Pass
	It shall not exclude uses of the machine that can reasonably be expected from its designation and description and shall also warn about the risk which would result from using the machine in other ways than the ones described in the information, especially considering its reasonably foreseeable misuse.	All the information is stated in the appropriate place.	Pass
6.4.1.3	Information for use shall cover, separately or in combination, transport, assembly and installation, commissioning, use of the machine (setting, teaching/programming or process changeover, operation, cleaning, fault-finding and maintenance) and, if necessary, dismantling, disabling and scrapping.	All the information is stated in the appropriate place.	Pass
6.4.2	Location and nature of the information for use		-
	Depending on the risk , the time when the information is needed by the user and the machine design , it shall be decided whether the information – or parts thereof – are to be given:	All the information is stated in the appropriate place.	Pass
	- in /on the machine itself (see 6.3 and 6.4.4)	Adequate information stated in the machine itself.	Pass
	-in accompanying documents (in particular instruction handbook , see 6.4.5)	Adequate information is stated in the accompanying documents	Pass
	- on the packaging	Adequate information is stated on the packaging	Pass
	- by other means such as signals and warnings outside the machine.	Adequate information is stated	Pass

	Standardized phrases shall be considered where important messages such as warnings need to be given (see also IEC 62079)	This requirement is considered.	Pass
6.4.3	Signals and warning devices		-
	Visual signals (e.g. flashing lights) and audible signals (e.g. sirens) may be used to warn of an impending hazardous event such as machine start-up or overspeed.	Signals and warning devices are provided.	Pass
	Such signals may also be used to warn the operator before the triggering of automatic protective measures (see last paragraph of 5.2.7)	Please see the related clause.	Pass
	It is essential that these signals:		-
	- be emitted before the occurrence of the hazardous event;	This requirement is taken into account during design and selection of the warning devices.	Pass
	- be unambiguous;	This requirement is taken into account during design and selection of the warning devices.	Pass
	- be clearly perceived and differentiated from all other signals used; - be clearly recognized by the operator and other persons.	This requirement is taken into account during design and selection of the warning devices.	Pass
	The warning devices shall be designed and located such that checking is easy.	This requirement is taken into account during design and selection of the warning devices.	Pass
	The information for use shall prescribe regular checking of warning devices.	This requirement is taken into account during design and selection of the warning devices.	Pass
	The attention of designers is drawn to the risks from “sensorial saturation” which results from too many visual and/or acoustic signals, which may also lead to defeating the warning devices.	This requirement is taken into account during design and selection of the warning devices.	Pass
6.4.4	Markings, signs (pictograms), written warnings		-
	Machinery shall bear all markings which are necessary:		-
	a) for its unambiguous identification, at least - name and address of the manufacturer; - designation of series or type; - serial number, if any.	Adequate information is provided.	Pass
	b) in order to indicate its compliance with mandatory requirements;		-
	- marking; -written indications (e.g. for machines intended for use in potentially explosive atmosphere)	Adequate information is provided.	Pass
	c) for its safe use, e.g. :		-

	- maximum speed of rotating parts; - maximum diameter of tools; -mass (expressed in kilograms) of the machine itself and/or of removable parts - maximum working load; - necessity of wearing personal protective equipment; - guard adjustment data; - frequency of inspection.	Adequate information is provided.	Pass
	Information printed directly on the machine should be permanent and remain legible throughout the expected life of the machine.	This requirement is complied with.	Pass
	Signs or written warnings only saying “danger” shall not be used.	This requirement is complied with.	Pass
	Readily understandable signs (pictograms) should be used in preference to written warnings.	This requirement is complied with.	Pass
	Signs and pictograms should only be used if the are understood in the culture in which the machinery is to be used.	This requirement is complied with.	Pass
	Markings shall comply with recognized standards (see ISO 2972, ISO 7000, particularly for pictograms, symbols, colours) See EN 60204 series as regards marking of electrical equipment.	This requirement is complied with.	Pass
6.4.5	Accompanying documents (in particular, instruction handbook)		-
6.4.5.1	Contents		-
	The instruction handbook or other written instructions (e.g. on the packaging) shall contain among others:		-
	a) information relating to transport, handling and storage of the machine e.g. :	All the related information is stated in the instruction handbook	Pass
	- storage conditions for the machine;	All the related information is stated in the instruction handbook	Pass
	-dimensions , mass value(s), position of the centre (s) of gravity;	All the related information is stated in the instruction handbook	Pass
	-indications for handling (e.g. drawings indicating application points for lifting equipment)	All the related information is stated in the instruction handbook	Pass
	b) information relating to installation and commissioning of the machine, e.g.		-
	- fixing/anchoring and vibration dampening requirements	All the related information is stated in the instruction handbook	Pass
	- assembly and mounting conditions;	All the related information is stated in the instruction handbook	Pass
	- space needed for use and maintenance;	All the related information is stated in the instruction handbook	Pass

	- permissible environmental conditions (e.g. temperature, moisture, vibration, electromagnetic radiation);	All the related information is stated in the instruction handbook	Pass
	-instructions for connecting the machine to power supply (particularly about protection against electrical overloading);	All the related information is stated in the instruction handbook	Pass
	- advice about waste removal /disposal;	All the related information is stated in the instruction handbook	Pass
	-if necessary, recommendations about protective measures which have to be taken by the user; e.g. additional safeguards, safety distances, safety signs and signals.	All the related information is stated in the instruction handbook	Pass
	c) information relating to the machine itself, e.g. :		-
	-detailed description of the machine, its fittings, its guards and/or protective devices;	All the related information is stated in the instruction handbook	Pass
	-comprehensive range of applications for which the machine is intended, including prohibited usages, if any , taking into account variations of the original machine if appropriate.	All the related information is stated in the instruction handbook	Pass
	-diagrams (especially schematic representation of safety functions);	All the related information is stated in the instruction handbook	Pass
	- data about noise and vibration generated by the machine, about radiation, gases, vapours, dust emitted by it, with reference to the measuring methods used.	All the related information is stated in the instruction handbook	Pass
	-technical documentation about electrical equipment (see EN 60204 series)	All the related information is stated in the instruction handbook	Pass
	-documents attesting that the machine complies with mandatory requirements;	All the related information is stated in the instruction handbook	Pass
	d)information relating to the use of the machine, e.g. about:	All the related information is stated in the instruction handbook	Pass
	- intended use; - description of manual controls (actuators); - setting and adjustment; - modes and means for stopping (especially emergency stop) - risks which could not be eliminated by the protective measures taken by the designer; - particular risks which may be generated by certain applications, by the use of certain fittings, and about specific safeguards which are necessary for such applications. -reasonably foreseeable misuse and prohibited usages; - fault identification and location , repair, and re-starting after an intervention; - personal protective equipment which need to be usd and training required.	All the related information is stated in the instruction handbook	Pass

	e) information for maintenance e.g.	All the related information is stated in the instruction handbook	Pass
	-nature and frequency of inspections for safety functions; -instructions relating to maintenance operations which require a definite technical knowledge or particular skills and hence should be carried out exclusively by skilled persons (e.g. maintenance staff, specialists) - instructions relating to maintenance actions (e.g. replacement of parts) which do not require specific skills and hence may be carried out by users (e.g. operators) -drawings and diagrams enabling maintenance personnel to carry out their task rationally (especially fault-finding tasks) f) information relating to de-commissioning , dismantling and disposal; g) information for emergency situations , e.g. : - type of fire-fighting equipment to be used. - warning about possible emission or leakage of harmful substance(s), and if possible, indication of means to fight their effects.	All the related information is stated in the instruction handbook	Pass
	h) maintenance instructions provided for skilled persons (second dash in e))and maintenance instructions provided for unskilled persons (third dash in e)), that should appear clearly separated from each other.	All the related information is stated in the instruction handbook	Pass
6.4.5.2	Production of the instruction handbook	All the related information is stated in the instruction handbook	Pass
	a) type and size of print shall ensure the best possible legibility. Safety warnings and/or cautions should be emphasized the use of colours, symbols and/or large print.	All the related information is stated in the instruction handbook	Pass
	b) information for use shall be given in the language(s) of the country in which the machine will be used for the first time and in the original version. If more than one language are to be used, each language should be readily distinguished from the other(s), and efforts should be made to keep the translated text and the relevant illustration together.	All the related information is stated in the instruction handbook	Pass
	c) whenever helpful to the understanding, text should be supplemented with written details enabling, for instance, manual controls (actuators) to be located and identified; they should not be separated from the accompanying text and should follow sequential operations.	All the related information is stated in the instruction handbook	Pass
	d) consideration should be given to presenting information in tabular form where this will aid understanding.Tables should be adjacent to the relevant text.	All the related information is stated in the instruction handbook	Pass

	e) the use of colours should be considered, particularly in relation to components requiring quick identification.	All the related information is stated in the instruction handbook	Pass
	f) when information for use is lengthy, a table of contents and/or an index should be given.	All the related information is stated in the instruction handbook	Pass
	g) safety-relevant instructions which involve immediate action should be provided in a form readily available to the operator.	All the related information is stated in the instruction handbook	Pass
6.4.5.3	Drafting and editing information for use		-
	a) relationship to model : the information shall clearly relate to the specific model of machine and, if necessary, other appropriate identification (for example, by serial number).	All the related information is stated in the instruction handbook	Pass
	b) communicate principles : when information for use is being prepared, the communication process “see-think-use” should be followed in order to achieve the maximum effect and should follow sequential operations. The questions “how ?” and “why ?” should be anticipated and the answers provided.	All the related information is stated in the instruction handbook	Pass
	c) information for use shall be as simple and as brief as possible, and should be expressed in consistent terms and units with a clear explanation of unusual technical terms.	All the related information is stated in the instruction handbook	Pass
	d) when it is foreseen that a machine will be put to non-professional use, the instructions should be written in a form that is readily understood by the non-professional users. If personal protective equipment is required for the safe use of the machine, clear advice should be given, e.g. on the packaging as well as on the machine, so that this information is prominently displayed at the point of sale.	All the related information is stated in the instruction handbook	Pass
	e) durability and availability of the documents : documents giving instructions for use should be produced in durable form (i.e. they should be able to survive frequent handling by the user). It may be useful to mark them “keep for future reference”. Where information for use is kept in electronic form (e.g. CD, DVD, tape) information on safety-related issues that need immediate action shall always be backed up with a hand copy that is readily available.	All the related information is stated in the instruction handbook	Pass
7	Documentation of risk assessment and risk reduction		-
	The documentation shall demonstrate the procedure that has been followed and the results that have been achieved. This includes, when relevant, documentation		-
	a)the machinery for which the risk assessment has been made (for example, specifications, limits, intended use);	See the risk assessment report in detail.	Pass
	b) any relevant assumptions that have been made (loads, strengths, safety factors, etc.);	See the risk assessment report in detail.	Pass

	c) the hazards and hazardous situations identified and the hazardous events considered in the risk assessment	See the risk assessment report in detail.	Pass
	d) the information on which risk assessment was based (see 5.2):	See the risk assessment report in detail.	Pass
	1) the data used and the sources (accident histories, experience gained from risk reduction applied to similar machinery, etc.);	See the risk assessment report in detail.	Pass
	2) the uncertainty associated with the data used and its impact on the risk assessment;	See the risk assessment report in detail.	Pass
	e) the risk reduction objectives to be achieved by protective measures;	See the risk assessment report in detail.	Pass
	f) the protective measures implemented to eliminate identified hazards or to reduce risk;	See the risk assessment report in detail.	Pass
	g) residual risks associated with the machinery;	See the risk assessment report in detail.	Pass
	h) the result of the risk assessment (see Figure 1);	See the risk assessment report in detail.	Pass
	i) any forms completed during the risk assessment.	See the risk assessment report in detail.	Pass

3.2 EN60204-1 TEST REPORT

1	Scope		-
	This part of EN 60204 applies to the application of electrical,electronic and programmable electronic equipment and systems to machines not portable by hand woiking,including a group of machines working together in a co-ordinated manner.		Pass
	This part of EN 60204 is applicable to the electrical equipment or parts of the electrical equipment that operate with nominal supply voltages not exceeding 1000v for alternating current (AC)and not exceeding 1500V for direct current (DC),and with nominal supply frequencies not exceeding 200Hz.		Pass
2	Normative references		-
3	Terms and definitions		-
4	General requirements		-
4.1	General		-
	This part of EN 60204 is intended to apply to electrical equipment used with a wide variety of machines and with a group of machines working together in a co-ordinated manner.		Pass
	The risks associated with the hazards relevant to the electrical equipment shall be assessed as part of the overall requirements for risk 120 assessment of the machine.This will determine the adequate risk reduction, and the necessary protective measures for persons who can be exposed to those hazards, while still maintaining an acceptable level of performance of the machine and its equipment.	Please see the risk assessment report in detail.	Pass
4.2	Selection of equipment		-
4.2.1	General		-
	Electrical componets and devices shall:		-
	-be suitable for their intended use;and	This requirement has been considered during design.	Pass
	-conform to relevant IEC standards where such exist; and	This requirement has been considered during design.	Pass
	-be applied in accordance with the supplier ‘s instructions.	This requirement has been considered during design.	Pass
4.2.2	Electrical equipment in compliance with the IEC 60439 series		-
	The electrical equipment of the machine shall satisfly the safety requirements identified by the risk assessment of the machine. Depending upon the machine,its intended use and its electrical equipment, the designer may select parts of the electrical equipment of the machine that are in compliance with EN 60439-1 and, as necessary, other relevant parts of the EN 60439 series (see also Annex F）.		Pass
4.3	Electrical supply		-

	The electrical equipment shall be designed to operate correctly with the relevant conditions of supply	They can be operated correctly with the relevant conditions of supply.	Pass
4.4	Physical environmet and operating conditions		-
	Shall be suitable for use as specified: -Electromagetic compatibility -Ambient air temperature -Humidity -Altitude -Contaminants -Ionizing and non-ionizing radiation -Vibration, shock and bump	This machine is suitalbe for use as specified in this clause.	Pass
4.5	Transportation and storage		-
	Electrical equipment shall be designed to withstand, or suitable precautions shall be taken to protect against, the effects of transportation and storage temperatures within a range of -25℃ to +55℃ and for short periods not exceeding 24 h at up to +70℃. Suitable means shall be provided to prevent damage from humidity, vibration, and shock. A special agreement can be necessary between the supplier and the user(see Annex B).	These requirements have been met.	Pass
4.6	Provisions for handling		-
	Heavy and bulky electrical equipment that has to be removed from the machine for transport, or that is independent of the machine, shall be provided with suitable means for handling by cranes or similar equipment.		Not applicable
4.7	Installation		-
	Electrical equipment shall be installed in accordance with the electrical equipment supplier’s instructions.		Pass
5	Incoming supply conductor terminations and devices for disconnecting and switching off		-
5.1	Incoming supply conductor terminations		-
	It is recommended that, where practicable, the electrical equipment of a machine is connected to a single incoming supply. Where another supply is necessary for certain parts of the equipment(for example, electronic equipment that operates at a different voltage),that supply should be derived, as far as is practicable, from devices (for example, transformers, converters) forming part of the electrical equipmernt of the machine. For large complex machinery comprising a number of widely-spaced machines working together in a coordinated manner, there can be a need for more than one incoming supply depending upon the site supply arrangements (see5.3.1).	Single power supply.	Pass
	Unless a plug is provided with the machine for the connection to the supply (see 5.3.2e), it is recommended that the supply conductors are terminated at the supply disconnecting device.	The supply conductors are terminated at the supply disconnecting device.	Pass

	Where a neutral conductor is used it shall be clearly indicated in the technical documentation of the machine, such as in the installation diagram and in the circuit diagram, and a separate insulated terminal, labelled N in accordance with 16.1, shall be provided for the neutral conductor(see also Annex B).	Neutral conductor has been used and sastified this requierement.	Pass
	There shall be no connection between the neutral conductor and the protective bonding circuit inside the electrical equipment nor shall a combined PEN terminal be provided.	These requirements have been met.	Pass
	All terminals for the incoming supply connection shall be clearly identified in accordance with IEC60445 and 16.1. For the identificaton of the external protective conductor terminal,see5.2.	All of them have been identified clearly.	Pass
5.2	Terminal for connection to the external protective earthing system		-
	For each incoming supply, a terminal shall be provided in the vicinity of the associated phase conductor terminals for connection of the machine to the external protective earthing system or to the external protective conductor, depending upon the supply distribution system.	A terminal has been provided for each incoming supply.	Pass
	The terminal shall be of such a size as to enable the connection of an external protective copper conductor with a cross-sectional area in accordance with Table 1.	This requirement has been met.	Pass
	Where an external protective conductor of a material other than copper is used, the terminal size shall be selected accordingly (see also 8.2.2).	This requirement has been met.	Pass
	At each incoming supply point, the terminal for connection of the external protective earthing system or the external protective conductor shall be marked or labelld with the letters PE(see IEC60445).	This requirement has been met.	Pass
5.3	Supply disconnecting(isolating) device		-
5.3.1	General		-
	A supply disconnecting device shall be provided: -for each incoming source of supply to a machine(s); -for each on-board power supply.	A supply disconnecting device is provided.	Pass
	The supply disconnecting device shall disconnect (isolate) the electrical equipment of the machine from the supply when required(for example for work on the machine, including the electrical equipment).	This device can disconnect the electrical equipment of the machine from supply.	Pass
	When two or more supply disconnecting devices are provided, protective interlocks for their correct operation shall aso be provided in order to prevent a hazardous situation, including damage to the machine or to the work in progress.		Not applicable
5.3.2	Type		-
	The supply disconnecting device shall be one of the following types:		-

	a) switch-disconnector,with or without fuses, in accordance with IEC 60947-3, utilization category AC-23B or DC-23B; b) disconnector, with or without fuses, in accordance with IEC60947-3, that has an auxiliary contact that in all cases causes switching devices to break the load circuit before the opening of the main contacts of the disconnector; c) a circuit-breaker suitable for isolation in accordance with IEC 60947-2; d) any other switching device ing accordance with an IEC product standard for that device and which meets the isolation requirements of IE C60947-1 as well as a utilization category defined in the product standard as appropriate for on-load switching of motors or other inductive loads; e) a plug/socket combination for a flexible cable supply.		Pass
5.3.3	Requirements		-
	When the supply disconnecting device is one of the types specified in 5.3.2a) to d) it shall fulfill all of the following requiremnts:		-
	-isolate the electrical equipment from the supply and have one OFF(isolated) and one ON position marked with“O”and”I”(symbols IEC60417-5008 and IEC60417-5007,see10.2.2);		Pass
	-have a visible contact gap or a position indicator which cannot indicate OFF(isolated)until all contacts are actually open and the requirements for the isolating function have been satisfied;		Pass
	-have an external operating means (for example handle),(exception:power-operated switchgear need not be operable form outside the enclosure where there are other means to open it).Where the external operating means is not intended for emergency operations,it is recommended that it be coloured BLACK or GREY (see 10.7.4and 10.8.4);		Pass
	-be provided with a means permitting it to be locked in the OFF(isolated) position(for example by padlocks).When so locked, remote as well as local closing shall be prevented;	Padlock has been provided.	Pass
	-disconnect all live conductors of its power supply circuit. However,for TN supply systems,the neutral conductor may or may not be disconnected except in countries where disconnection of the neutral conductor(when used)is compulsory;		Pass
	-have a breaking capacity sufficient to interrupt the current of the largest motor when stalled together with the sum of the normal running currents of all other motors and/or loads.The calculated breaking capacity may be reduced by the use of a proven diversity factor.	It has sufficeent breaking sufficient to interrupt the current.	Pass
	When the supply disconnecting device is a plug/socket combination, it shall fulfill the following requirements:		Not applicable

	-have the switching capability, or be Interlocked with a switching device that has a breaking capacity, sufficient to interrupt the current of the largest motor when stalled together with the sum of the normal running currents of all other motors and/or loads.The calculated breaking capacity may be reduced by the use of a proven diversity factor.When the interlocked switching device is electrically operated(for example a contactor) it shall have an appropriate utilisation category.		Not applicable
	-a) to f) of 13.4.5		Not applicable
	Where the supply disconnecting device is a plug/socket combination,a switching device with an appropriate utilisation category shall be provided for switching the machine on and off.		Not applicable
	This can be achieved by the use of the interlocked switching device described above.		Not applicable
5.3.4	Operating means		-
	The operating means(for example, a handle)of the supply disconnecting device shall be easily accessible and located between 0,6m and 1,9m above the servicing level. An upper limit of 1,7m is recommended.		Pass
5.3.5	Excepted circuits		-
	The following circuits need not be disconnected by the supply disconnecting device:		-
	-lighting circuits for lighting needed during maintenance or repair;		Not applicable
	-plug and socket outlets for the exclusive connection of repair or maintenance tools and equipment(for example hand drills.test equipment);		Not applicable
	-undervoltage protection circuits that are only provided for automatic tripping inf the event of supply failure;		Not applicable
	-circuits supplying equipment that should normally remain energized for correct operation(for example temperature controlled measuring devices, product (work in progress heaters, program storage devices);		Not applicable
	-control circuits for interlocking.		-
	It is recommended, however, that such circuits be provided with their own disconnecting device.		Not applicable
	Where such a circuit is not disconnected by the supply disconnecting device:		Not applicable
	- permanent warning label(s) in accordance with 16.1 shall be appropriately placed in proximity to the supply disconnecting device;		-
	- a corresponding statement shall be included in the maintenance manual, and one or more of the following shall apply;		-
	- a permanent warning label in accordance with I6.1 is affixed in proximity to each excepted circuit, or		-
	-the excepted circuit is separated from other circuits, or		-
	- the conductors are identified by colour taking into account the recommendation of 13.2.4		-

5.4	Devices for switching off for prevention of unexpected start-up		-
	Devices for switching off for the prevention of unexpected start-up shall be provided (for example where, during maintenance, a start-up of the machine or part of the machine can create a hazard).	There is such function to prevent unexpected start-up.	Pass
	Such devices shall be appropriate and convenient for the intended use, shall be suitably placed, and readily identifiable as to their function and purpose (for example by a durable marking in accordance with 16.1 where necessary).	These requirements have been met.	Pass
	Means shall be provided to prevent inadvertent and/or mistaken closure of these devices either at the controller or from other locations (see also 5.6).	A switch with key has been used.	Pass
	The following devices that fulfill the isolation function may be provided for this purpose:		-
	- devices described in 5.3.2, -disconnectors, withdrawable fuse links and withdrawable links only if located in an enclosed electrical operating area (see 3.19).		Pass
5.5	Devices for disconnectins electrical equipment		-
	Devices shall be provided for disconnecting (isolating) electrical equipment to enable work to be carried out when it is de-energised and isolated.Such devices shall be:	Devices have been provided for disconnecting electrical equipment.	Pass
	- appropriate and convenient for the intended use;		Pass
	- suitably placed;		Pass
	-readily identifiable as to which part(s) or circuit(s) of the equipment is served (for example by durable marking in accordance with 16.1 where necessary) .		Pass
	Means shall be provided to prevent inadvertent and/or mistaken closure of these devices either at the controller or from other locations (see also 5.6).		Pass
	The supply disconnecting device (see 5 .3) may, in some cases, fulfill that function. However, where it is necessary to work on individual parts of the electrical equipment of a machine, or on one of a number of machines fed by a common conductor bar, conductor wire or inductive power supply system, a disconnecting device shall be provided for each part, or for each machine, requiring separate isolation.		Pass
	In addition to the supply disconnecting device, the following devices that fulfill the isolation function may be provided for this purpose:		Pass
	- devices described in 5.3.2;		Pass
	-disconnectors, withdrawable fuse links and withdrawable links only if located in an electrical operating area (see 3.15) and relevant information is provided with the electrical equipment (see 17.2 b) 9)and b)12)).		Pass
5.6	Protection against unauthorized, inadvertent and/or mistaken connection		-

	The devices described in 5.4 and 5.5 that are located outside an enclosed electrical operating area shall be equipped with means to secure them in the OFF position (disconnected state), (for example by provisions for padlocking, trapped key interlocking).When so secured, remote as well as local reconnection shall be prevented.	No need.	Not applicable
	Where a non-lockable disconnecting device (for example withdrawable fuse-links, withdrawable links) other means of protection against reconnection (for example warning labels in accordance with 16.1) may be provided.		Not applicable
	However, when a plug/socket combination according to 5.3.2 e) is so positioned that it can be kept under the immediate supervision of the person carrying out the work, means for securing in the disconnected state need not be provided.		Not applicable
6	Protection against electric shock		-
6.1	General		-
	The electrical equipment shall provide protection of persons against electric shock from:		-
	- direct contact (see 6.2 and 6.4);	Please see the relative report.	Pass
	- indirect contact (see 6.3 and 6.4).	Please see the relative report.	Pass
	The measures for this protection given in 6.2, 6.3, and, for PELV, in 6.4, are a recommended selection from IEC 60364-4-41. Where those recommended measures are not practicable, for example due to the physical or operational conditions, other measures from IEC 60364-4-41 may be used.	Please see the relative report.	Pass
6.2	Protection against direct contact		-
6.2.1	General		-
	For each circuit or part of the electrical equipment, the measures of either 6.2.2 or 6.2.3 and, where applicable, 6.2.4 shall be applied.	Please see the relative report.	Pass
6.2.2	Protection by enclosures		-
	Live parts shall be located inside enclosures that conform to the relevant requirements of Clauses 4, 11, and 14 and that provide protection against direct contact of at least IP2X or IPXXB (see IEC 60529).		Pass
	Where the top surfaces of the enclosure are readily accessible, the minimum degree of protection against direct contact provided by the top surfaces shall be IP4X or IPXXD.		Not applicable
	Opening an enclosure (i.e. opening doors, lids, covers, and the like) shall be possible only under one of the following conditions:		-
a)	The use of a key or tool is necessary for access. For enclosed electrical operating areas, see IEC 60364-4-41, or IEC 60439-1 as appropriate.	Tool is necessary for access to enclosed electrical operating areas.	Pass

	All live parts, that are likely to be touched when resetting or adjusting devices intended for such operations while the equipment is still connected, shall be protected against direct contact to at least IP2X or IPXXB. Other live parts on the inside of doors shall be protected against direct contact to at least IP1X or IPXXA.		Pass
b)	The disconnection of live parts inside the enclosure before the enclosure can be opened. This may be accomplished by interlocking the door with a disconnecting device (for example, the supply disconnecting device) so that the door can only be opened when the disconnecting device is open and so that the disconnecting device can only be closed when the door is closed.		Not applicable
c)	Opening without the use of a key or a tool and without disconnection of live parts shall be possible only when all live parts are protected against direct contact to at least IP2X or IPXXB (see IEC 60529). Where barriers provide this protection, either they shall require a tool for their removal or all live parts protected by them shall be automatically disconnected when the barrier is removed.		Not applicable
6.2.3	Protection by insulation of live parts		-
	Live parts protected by insulation shall be completely covered with insulation that can only be removed by destruction.		Pass
	Such insulation shall be capable of withstanding the mechanical, chemical, electrical, and thermal stresses to which it can be subjected under normal operating conditions.		Pass
6.2.4	Protection against residual voltafes		-
	Live parts having a residual voltage greater than 60 V after the supply has been disconnected shall be discharged to 60 V or less within a time period of 5 s afler disconnection of the supply voltage provided that this rate of discharge does not interfere with the proper functioning of the equipment. Exempted from this requirement are components having a stored charge of 60 µC or less.		Not applicable
	Where this specified rate of discharge would interfere with the proper functioning of the equipment, a durable waming notice drawing attention to the hazard and stating the delay required before the enclosure may be opened shall be displayed at an easily visible location on or immediately adjacent to the enclosure containing the capacitances.		Not applicable
	If the withdrawal of plugs or similar devices would make the exposure of the conductors (e.g. pins), the discharge time shall not exceed 1 second such conductor shall have the protection degree at least IP2X or IPXXB		Not applicable
6.2.5	Protection by barriers		-
	For protection by barriers, 4.12.2 of IEC 60364-4-41 shall apply.		Not applicable

6.2.6	Protection by placing out of reach or protection by obstacles		-
	For protection by placing out of reach, 4.12.4 of IEC 60364-4-41 shall apply.		Not applicable
	For protection by obstacles, 4.12.3 of IEC 60364-4-41 shall apply,		Not applicable
	For conductor wire systems or conductor bar systems with a degree of protection less than IP2X, see 12.7.1		Not applicable
6.3	Protection against indirect contact		-
6.3.1	General		-
	Protection against indirect contact (3.29) is intended to prevent hazardous situations due to an insulation fault between live parts and exposed conductive parts.		-
	For each circuit or part of the electrical equipment, at least one of the measures in accordance with 6.3.2 to 6.3.3 shall be applied:		-
	-measures to prevent the occurrence of a touch voltage (6.3.2); or	See the relative clause.	Pass
	-automatic disconnection of the supply before the time of contact with a touch voltage can become hazardous (6.3.3).	See the relative clause.	Pass
6.3.2	Prevention of the occurrence of a touch voltage		-
6.3.2.1	General		-
	Measures to prevent the occurrence of a touch voltage include the following:		-
	- provision of class II equipment or by equivalent insulation; -electrical separation.	See the relative clause.	Pass
6.3.2.2	Protection by provision of class II equipment or by equivalent insulation		-
	This measure is intended to prevent the occurrence of touch voltages on the accessible parts through a fault in the basic insolation.		-
	This protection is provided by one or more of the followings:		-
	-class II electrical devices or apparatus (double insulation, reinforced insulation or by equivalent insulation in accordance with IEC 61140); -switchgear and control gear assemblies having total insulation in accordance with IEC 60439-1; - supplementary or reinforced insulation in accordance with 4.13.2 of lEC 60364-4-41	Appropriate insulations have been provided.	Pass
6.3.2.3	Protection by electrical separation		-
	Electrical separation of an individual circuit is intended to prevent a touch voltage through contact with exposed conductive parts that can be energized by a fault in the basic insulation of the live parts of that circuit.		-
	For this type of protection, the requirements of 4.13.5 of lEC 60364-4-41 apply.	Appropriate measures have been taken.	Pass
6.3.3	Protection by automatic disconnection of supply		-
	This measure necessitates co-ordination between:		-
	- the type of supply and earthing system;		-
	- the impedance values of the different elements of the protective bonding system;		-

	-the characteristics of the protective devices that detect insulation fault(s).		-
	Automatic disconnection ofthe supply of any circuit affected by an insulation fault is intended to prevent a hazardous situation resulting from a touch voltage.		-
	This protective measure comprises both:		-
	-protective bonding of exposed conductive parts (see 8.2.3),	This measure has been taken.	Pass
	- and either:		-
	a)overcurrent protective devices for the automatic disconnection of the supply on detection of an insulation fault in TN systems, or	This measure has been taken.	Pass
	b) b) residual current protective devices to initiate the automatic disconnection of the supply on detection of an insulation fault from a live part to exposed conductive parts or to earth in TT systems,or		Not applicable
	c) insulation monitoring or residual current protective devices to initiate automatic disconnection of ITsystems. Except where a protective device is provided to interrupt the supply in the case of the first earth fault, an insulation monitoring device shall be provided to indicate the occurrence of a first fault from a live part to exposed conductive parts or to earth. This insulation monitoring device shall initiate an audible and/or visual signal which shall continue as long as the fault persists.		Not applicable
	Where automatic disconnection is provided in accordance with a), and disconnection within the time specified in Clause A.1 cannot be assured supplementary bonding shall be provided as necessary to meet the requirements of Clause A.3.		Not applicable
6.4	Protection by the use of PELV		-
6.4.1	General requirements		-
	PELV (protective extra-low voltage) circuits shall satisfy all of the conditions specified in this clause	No PELV circuit has been u.sed.	Not applicable
6.4.2	Sources for PELV		-
	The sources for PELV shall be one of the conditions specified in this clause	No PELV circuit has been u.sed.	Not applicable
7	Protection of equipment		-
7.1	General		-
7.2	Over current protection		-
7.2.1	General		-
7.2.2	Supply conductors		-
	The supplier is not responsible for providing the over current device for the supply conductors.		Pass
	Installation diagram with data necessary for selection of the over current protective device	Relative information has been provided.	Pass
7.2.3	Power circuits		-
	All conductors shall be protected against over current (except earthed neutral conductor)	All conductors have been protected against overcurrent.	Pass

	Cross-section area of neutral conductor	Cross-section area of neutral conductor is equal to the phase conductors.	Pass
	For neutral conductors smaller than phase conductors then IEC 364-4-473 shall apply		Not applicable
	In IT-systems, it is recommended that the neutral conductor is not used		Not applicable
7.2.4	Control circuits		-
	Conductors of control circuits connected to the supply voltage and of circuits feeding control circuit transformers shall be protected against over current in accordance with 7.2.3		Not applicable
	Conductors of control circuits supplied by a control circuit transformer or DC supply shall be protected against overcurrent (see also 9.4.3.1)		Not applicable
7.2.5	Socket outlets and their associated conductors		-
	Over current protection devices shall be provided in the unearthed live conductors		Not applicable
7.2.6	Lighting circuits		-
	All unearthed conductors of circuits supplying lighting shall be protected against the effects of hort circuits by the provision of over current devices separate from those protecting other circuits		Not applicable
7.2.7	Transformers		-
	Transformers shall be protected against over current in accordance with IEC 60076-5 and IEC 60743 as appropriate		Not applicable
	The type and setting of the overcurrent protective device should be in accordance with the recommendations of the transformer supplier		Not applicable
7.2.8	Location of over current protective device		-
	Over current protective device shall be located at the point where the conductors to be protected are connected to their supply	This requirement has been considered during design.	Pass
7.2.9	Over current protective devices		-
	Sufficient breaking capacity	The over current protective devices have sufficient breaking capacity.	Pass
	Where fuses are used, a type readily available in the country of use shall be selected, or arrangement shall be made with the use for the supply of spare parts	This requirement has been considered during design.	Pass
7.2.10	Rating and setting of over current protective devices		-
	The rated current of fuses or the setting current of other over current protective devices shall be selected as low as possible but adequate for the anticipated over currents	This requirement has been met.	Pass
	The rated current or setting of an over current protective device is determined by the current carrying capacity of the conductors to be protected by that device in accordance with 13.4	This requirement has been considered during design.	Pass
7.3	Protection of motors against overheating		-
7.3.1	General		-

	Overload protection of motors shall be provided for each motor rated at more than 0.5kW	The overload protection is provided	Pass
	Protection of motors against overheating can be achieved by: - overload protection-over -temperature protection -current-limiting protection	Appropriate protection has been taken.	Pass
7.3.2	Overload protection		-
	Detection of overload shall be provided in each live conductor excepted for the neutral conductor		Pass
	For motors having single-phase or d.c power supplies. Detection in only one unearthed live conductor is permitted		Not applicable
	Where overload protection is achieved by switching off, the switching device shall switch off all live conductors. The switching of the neutral conductor is not necessary for overload protection.		Not applicable
	Where motors with special duty ratings are required to start or to brake frequently it can be difficult to provide overload protection with a time constant comparable with that of the winding to be protected. Appropriate protective devices designed To accommodate special duty motors or over-temperature protection (see 7.3.3) can be necessary.		Not applicable
	For motors that cannot be overloaded (for example torque motors, motion drives that either are protected by mechanical overload protection devices or are adequately dimensioned), overload protection is not required		Not applicable
7.3.3	Over-temperature protction		-
	The provision of motors with over-temperature protection(see IEC 60034-11) is recommended in situations where the cooling can be impaired (for example dusty environments).	Over-temperature protection devices have been provided.	Pass
	Depending upon the type of motor, rotection under stalled rotor or loss of phase conditions is not always ensured by over-temperature protection, and additional protection should then be provided.		Not applicable
	Over-temperature protection is also recommended for motors that cannot be overloaded (for example torque motors, motion drives that are either protected by mechanical overload protection devices or are adequately dimensioned), where the possibility of over-temperature exists (for example due to reduced cooling).		Not applicable
7.3.4	Current limiting protection		-
	Where protection against the effects of overheating in three phase motors is achieved by current limitation, the number of current limitation devices may be reduced from 3 to 2 (see 7.3.2). For motors having single phase AC or DC power supplies, current limitation in only one unearthed live conductor is permitted.		Not applicable
7.4	Abnormal temperature protection		-
	Use of abnormal temperature protection	No need.	Not applicable

7.5	Protection against supply interruption or voltage reduction and subsequent restoration		-
	Where a voltage drop or a supply interruption can cause a hazardous condition, damage to the machine, or to the work in progress, under voltage protection shall be provided	No this kind of hazard has been found.	Not applicable
	The operation of the under voltage device shall not impair the operation of any stopping control of the machine	No under voltage device is used.	Not applicable
	Upon restoration of the voltage or upon switching on the incoming supply, automatic or unexpected restarting of the machine shall be prevented	Automatic of unexpected restarting of the machine can be prevented.	Pass
	Where only a part of the machine or of the group of machines working together in a coordinated manner is affected by the voltage reduction or supply interruption, the under voltage protection shall initiate appropriate control responses to ensure co-oordination		Not applicable
7.6	Motor over speed protection		-
	Use of the motor over speed protection		Not applicable
7.7	Earth fault/residual current porotection		-
	Use of earth fault/residual current protection for automatic disconnection		Not applicable
7.8	Phase sequence protection		-
	Where an incorrect sequence of the supply voltage can cause a hazardous condition or damage to the machine, porotection shall be provided		Not applicable
7.9	Protection against over voltage due to lighting and to switching surges		-
	Protection devices can be provided toprotect against the effects of over voltages due to lighting or to switching surges		Not applicable
8	Equipotential bonding		-
8.1	General		-
8.2	Protective bonding circuit		-
8.2.1	General		-
	All parts of the protective bonding circuit shall be so designed that they are capable of withstanding the highest thermal and mechanical stresses that can be caused by earth-fault currents that could flow in that part of the protective bonding circuit.	All these circuits have been designed that are capable of withstanding the highest thermal and mechanical stresses	Pass
	Where the conductance of structural parts of the electrical equipment or of the machine is less than that of the smallest protective conductor connected to the exposed conductive parts, a supplementary bonding conductor shall be provided. This supplementary bonding conductor shall have a cross-sectional area not less than half that of the corresponding protective conductor.		Not applicable
	If an IT distribution system is used, the machine structure shall be part of the protective bonding circuit and insulation monitoring shall be provided. See 6.3.3 c).		Not applicable

	Conductive structural parts of equipment in accordance with 6.3.2.2 need not be connected to the protective bonding circuit. Extraneous conductive parts which form the structure of the machine need not be connected to the protective bonding circuit where all the equipment provided is in accordance with 6.3.2.2.		Pass
	Exposed conductive parts of equipment in accordance with 6.3.2.3 shall not be connected to the protective bonding circuit.		Pass
8.2.2	Protective conductors		-
	Protective conductors shall be identified in accordance with 13.2.2.	Please see clause 13.2.2 in detail.	Pass
	Copper conductors are preferred.		-
	Where a conductor material other than copper is used, its electrical resistance per unit length shall not exceed that of the allowable copper conductor and such conductors shall be not less than I 6 mm^2 in cross-sectional area.	Only copper conductors are used.	Not applicable
	The cross-sectional area of protective conductors shall be determined in accordance with the requirements of: - 543 of IEC 60364-5-54; or - 7 4.3.1.7 of lEC 60439-1, as appropriate.	They have been used according to these requirements.	Pass
	This requirement is met in most cases where the relationship between the cross-sectional area of the phase conductors associated with that part of the equipment and the cross-sectional area of the associated protective conductor is in accordance with Table 1 (see 5.2).		-
	See also 8.2.8.		-
8.2.3	Continuity of the protective bonding circuit		-
	All exposed conductive parts shall be connected to the protective bonding circuit in accordance with 8.2.1.	All these parts have been connected.	Pass
	Where a part is removed for any reason (for example routine maintenance), the protective bonding circuit for the remaining parts shall not be interrupted .	This requirement has been met.	Pass
	Connection and bonding points shall be so designed that their current-carrying capacity is not impaired by mechanical, chemical, or electrochemical influences.	Their current-carrying capacity is stable enough	Pass
	Metal ducts of flexible or rigid construction and metallic cable sheaths shall not be used as protective conductors.	No this kind of construction has been used as protective bonding conductor.	Pass
	Nevertheless, such metal ducts and the metal sheathing of all connecting cables (for example cable armoring, lead sheath) shall be connected to the protective bonding circuit.	No metal duct or metal sheathing has been used.	Not applicable

	Where the electrical equipment is mounted on lids, doors, or cover plates, continuity of the protective bonding circuit shall be ensured and a protective conductor (see 8.2.2) is recommended. Otherwise fastenings, hinges or sliding contacts designed to have a low resistance shall be used (see 18.2.2, Test 1).	No electrical equipment is mounted on lids, doors, or cover plates.	Not applicable
	The continuity of the protective conductor in cables that are exposed to damage (for example flexible trailing cables) shall be ensured by appropriate measures (for example monitoring).	Appropriate protection has been provided.	Pass
	For requirements for the continuity of the protective conductor using conductor wires, conductor bars and slip-ring assemblies, see 12.7.2.	No this kind of device is used.	Not applicable
8.2.4	Exclusion of switching devices from the protective bonding circuit		-
	Shall not incorporate a switching device, an over current protective device nor a means for current detection for such devices		Pass
	The only means permitted for interruption shall be carried out by instructed or skilled persons by using a tool		Pass
	Where the continuity of the protective bonding circuit can be interrupted by means of removable current collectors or plug/ socket combinations, the protective bonding circuit shall be interrupted by a first make last break contact. This also applies to removable or withdrawable plug-in units (see also 13.4.5).		Not applicable
8.2.5	Parts that need not be connected to the bonding circuit		-
	Screws, rivets, and nameplates and to parts inside an enclosure, are not necessary to connect to the protective bonding circuit		Pass
8.2.6	Protective conductor connecting points		-
	All protective conductors shall be terminated in accordance with 13.1.1. The protective conductor connecting points shall have no other function and are not intended, for example, to attach or connect appliances or parts.	These connecting points have complied with the requirements	Pass
	Each protective conductor connecting point shall be marked or labeled as such using the symbol IEC 60417-5019 (DB:2002-10) : or with the letters PE, the graphical symbol being preferred, or by use of the bicolour combination GREEN-AND-YELLOW, or by any combination of these.	All these points have been marked appropriately.	Pass
8.2.7	Mobile machines		-
	On mobile machines with on-board power supplies, the protective conductors, the conductive structural parts of the electrical equipment, and those extraneous conductive parts which form the structure of the machine shall all be connected to a protective bonding terminal to provide protection electric shock.	Not a mobile machine with on-board power supply.	Not applicable

	-Where a mobile machine is also capable of being connected to an external incoming power supply, this protective bonding terminal shall be the connection point for the external protective conductor.		Not applicable
8.2.8	Additional protective bonding requirements for electrical equipment having earth leakage currents higher than 10 mA AC or DC		-
	Where electrical equipment has an earth leakage current (for example adjustable speed electrical power drive systems and information technology equipment) that is greater than 10 mA AC or DC in any incoming supply, one or more of the following conditions for the associated protective bonding circuit shall be satisfied:		Not applicable
a)	the protective conductor shall have a cross-sectional area of at least 10 mm^2 Cu or 16 mm^2 A1, through its total run;		Not applicable
b)	where the protective conductor has a cross-sectional area of less than 10 mm^2 Cu or 16 mm^2 A1, a second protective conductor of at least the same cross-sectional area shall be provided up to a point where the protective conductor has a cross-sectional area not less than 10 mm^2 Cu or 16 mm^2 A1;		Not applicable
c)	automatic disconnection of the supply in case of loss of continuity of the protective conductor.		-
	To prevent difficulties associated with electromagnetic disturbances, the requirements of 4.4.2 also apply to the installation of duplicate protective conductors.		Not applicable
	In addition, a warning label shall be provided adjacent to the PE terminal, and where necessary on the nameplate of the electrical equipment. The information provided under 17.2 b) 1) shall include information about the leakage current and the minimum cross-sectional area of the external protective conductor.		Not applicable
8.3	Functional bonding		-
	Protection against maloperation as a result of insulation failures can be achieved by connecting to a common conductor in accordance with 9.4.3.1	The measure described in this clause has been used.	Pass
	For recommendations regarding functional bonding to avoid maloperation due to electromagnetic disturbances, see 4.4.2.	See the relative clause.	Pass
8.4	Measures to limit the effects of high leakage current		-
	The effects of high leakage current can be restricted to the equipment having high leakage current by connection of that equipment to a dedicated supply transformer having separate windings. The protective bonding circuit shall be connected to exposed conductive parts of the equipment and, in addition, to the secondary winding of the transformer. The protective conductor(s) between the equipment and the econdary winding of the transformer shall comply with one or more of the arrangements described in 8.2.8.	The measure described in this clause has been used.	Pass

9	Control circuits and control functions		-
9.1	Control circuits		-
9.1.1	Control circuit supply		-
	Where control circuits are supplied from an source, control transformers shall be used for supplying the control circuits. Such transformers shall have separate windings.		Not applicable
	Where several transformers are used, it is recommended that the windings of those transformers be connected in such a manner that the secondary voltages are in phase.		Not applicable
	Where DC control circuits derived from an AC supply are connected to the protective bonding circuit (see 8.2.1), they shall be supplied from a separate winding of the AC control circuit transformer or by another control circuit transformer.		Not applicable
9.1.2	Control circuit voltages		-
	The nominal value of the control voltage shall be consistent with the correct operation of the control circuit. The nominal voltage shall not exceed 277 V when supplied from a transformer.		Not applicable
9.1.3	Protection		-
	Control circuits shall be provided with overcurrent protection in accordance with 7.2.4 and 7.2.10.		Not applicable
9.2	Control functions		-
9.2.1	Start functions		-
	Start functions shall operate by energizing the relevant circuit (see 9.2.5.2).		Not applicable
9.2.2	Stop functions		-
	Each machine shall be equipped with appropriate stop functions.		Not applicable
9.2.3	Operating modes		-
	Each machine can have one or more operating modes determined by the type of machine and its application. When a hazardous situation can result from a mode selection, unauthorized and/or inadvertent selection shall be prevented by suitable means (for example key operated switch, access code).	Only one operation mode	Not applicable
	Mode selection by itself shall not initiate machine operation. A separate actuation of the start control shall be required.		Not applicable
	For each specific operating mode, the relevant safety functions and/or protective measures shall be implemented.		Not applicable
	Indication of the selected operating mode shall be provided (for example the position of a mode selector, the provision of an indicating light, a visual display indication).		Not applicable
9.2.4	Suspension of safety functions and/or protective measures		-
	Where it is necessary to suspend safeguarding, a secure provision shall be provided to prevent automatic operation		Not applicable
9.2.5	Operation		-
9.2.5.1	General		-

	The necessary safety functions and/or protective measures (for example interlocks (see 9.3)) shall be provided for safe operation.		Not applicable
	Measures shall be taken to prevent movement of the machine in an unintended or unexpected manner after any stopping of the machine (for example due to locked-off condition, power supply fault, battery replacement, lost signal condition with cableless control) .		Not applicable
	Where a machine has more than one control station, measures shall be provided to ensure that initiation of commands from different control stations do not lead to a hazardous situation.		Not applicable
9.2.5.2	Start		-
	The start of an operation shall be possible only when all the safeguards are in place and functional(except described in 9.2.4)		Pass
	Hold-to-run control shall be used for the others machines, as appropriate		Not applicable
	Suitable interlocks shall be provided to secure correct sequential starting		Pass
	The use of more than one control station to initiate a start .		Not applicable
9.2.5.3	Stop		-
	Stop category 0 and/or stop category 1 and/or stop category 2 stop functions shall be provided as indicated by the risk assessment and the functional requirements of the machine		Not applicable
	Stop functions shall override related start functions (see 9.2.5.2).		Not applicable
	Where required, facilities to connect protective devices and interlocks shall be provided. If such a protective device or interlock causes a stop of the machine, it may be necessary for that condition to be signalled to the logic of the control system. The reset of the stop function shall not initiate any hazardous situation.		Not applicable
	Where more than one control station is provided, stop commands from any control station shall be effective when required by the risk assessment of the machine.		Not applicable
9.2.5.4	Emergency operations (emergency stop, switching off)		-
9.2.5.4.1	General		-
9.2.5.4.2	Emergency stop		-
	Shall function either as a category 0 stop or as a category 1 stop	Category 1 stop.	Pass
	The choice of the emergency stop shall be determined by the risk assessment of the machine	According to the result of risk assessment of the machine.	Pass
	Where a category 0 stop is used for emergency top function, it shall have only hard-wired electromechanical components	No category 0 stop is used for emergency stop function.	Not applicable
	The operation of emergency stop shall not depend on electronic logic or on the transmission of commands over a communications network or link	No this kind of situation.	Pass

	Where a category 1 stop is used for the emergency stop function, final removal of power to the machine actuators shall be ensured and carried out by means of electromechanical components	The final removal of power to the machine actuators is ensured by the controller and carried out by means of electromechanical components.	Pass
9.2.5.4.3	Emergency switching off		-
	Use of emergency switching off		Not applicable
9.2.5.5	Monitoring of command actions		-
	Movement or action of a machine or part of a machine that can result in a hazardous situation shall be monitored by providing, for example, overtravel limiters, motor overspeed detection, mechanical overload detection or anti-collision devices.	Not this kind of hazardous situation.	Not applicable
9.2.6	Other control functions		-
9.2.6.1	Hold-to-run controls		-
	Hold-to-run controls shall require continuous actuation of the control device(s) to achieve operation.	No hold-to-run control has been used.	Not applicable
9.2.6.2	Two-hand control		-
	Three types of two-hand control are available, the selection of which is determined by the assessment	No two-hand control has been used.	Not applicable
9.2.6.3	Enabling control		-
	It shall be designed to allow motion when actuated in one position only (In any other position motion shall be stopped)	These machines have been designed to allow motion when actuated in position only	Pass
9.2.6.4	Combined start and stop controls		-
	Push-buttons and similar control devices that, when operated, alternately initiate and stop motion shall only be provided for functions which cannot result in a hazardous situation.	No this kind of device has been used.	Not applicable
9.2.7	Cableless control		-
9.2.7.1	General		-
	Means shall be provided to readily remove or disconnect the power supply of the operator control station (see also 9.2.7.3).	No this kind of device has been used.	Not applicable
	Means (for example key operated switch, access code) shall be provided, as necessary, to prevent unauthorized use of the control station.		Not applicable
	Each operator control station shall carry an unambiguous indication of which machine(s) is (are) intended to be controlled by that operator control station		Not applicable
9.2.7.2	Control limitation		-
	Measures shall be taken to prevent the machine from responding to signals other than those from the intended operator control station(s) .		Not applicable
	Where necessary, means shall be provided so that the machine can only be controlled from operator control stations in one or more predetermined zones or locations.		Not applicable
9.2.7.3	Stop		-

	Operator control stations shall include a separate and clearly identifiable means to initiate the stop function of the machine or of all the motions that can cause a hazardous condition		Not applicable
	The actuating means to initiate this stop function shall not be marked or labeled as an emergency stop device		Not applicable
	A machine which is equipped wit cableless control shall have a means of automatically initiating the stopping of the machine and of preventing a potentially hazardous operation		Not applicable
9.2.7.4	Use of more than one control station		-
	Where a machine has more than one operator control station, including one or more cableless control stations, measures shall be provided to ensure that only one of the control stations can be enabled at a given time An indication of which operator control station is in control of the machine shall be provided at suitable locations as determined by the risk assessment of the machine.		Not applicable
	Exception: a stop command from any one of the control stations shall be effective when required by the risk assessment of the machine.		Not applicable
9.2.7.5	Battery-powered operator control stations		-
	A variation in the battery voltage shall not cause a hazardous situation. If one or more potentially hazardous motions are controlled using a battery-powered cableless operator control station, a clear warning shall be given to the operator when a variation in battery voltage exceeds specified limits. Under those circumstances, the cableless operator control station shall remain functional long enough for the operator to put the machine into a nonhazardous situation.		Not applicable
9.3	Protective interlocks		-
9.3.1	Reclosing or resetting of an interlocking safeguard		-
	The reclosing or resetting of an interlocking safeguard shall not initiate hazardous machine operation.	No safeguard can initiate machine motion or operation	Not applicable
9.3.2	Exceeding operating limits		-
	Where an operating limit (for example speed, pressure, position) can be exceeded leading to a hazardous situation, means shall be provided to detect when a predetermined limit(s) is exceeded and initiate an appropriate control action.		Not applicable
9.3.3	Operation of auxiliary functions		-
	The correct operation of auxiliary functions shall be checked by appropriate devices (for example pressure sensors).		Not applicable
9.3.4	Interlocks between different operations and for contrary motions		-
	Interlocking shall be provided against incorrect operation		Not applicable
9.3.5	Reverse current braking		-
	Use of reverse current braking		Not applicable
9.4	Control functions in the event of failure		-
9.4.1	General requirements		-

	Provision of control functions in case of failure according to the level of risk assessment.	According to the risk assessment.	Pass
9.4.2	Measures to minimize risk in the event of failure		-
9.4.2.1	Use of proven circuit techniques and components		-
	Use of proven circuit techniques and components	Appropriate components have been taken.	Pass
9.4.2.2	Provisions for redundancy		-
9.4.2.3	Use of diversity		-
9.4.2.4	Functional tests		-
	Carried out automatically by the control system or manually by inspection	By inspection manually.	Pass
9.4.3	Protection against maloperation due to earth faults, voltage interruptions and loss of circuit continuity		-
9.4.3.1	Earth faults		-
	Bonding to the protective bonding circuit may be provided according to 8.2 and the devices may be connected as described in 9.1.4	Make reference to the relevant clause.	Pass
9.4.3.2	Voltage interruptions		-
	Where a memory device is used, proper functioning in the event of power failure shall be ensured to prevent any loss of memory that can result in a hazardous condition	No memory device has been used.	Not applicable
9.4.3.3	Loss of circuit continuity		-
	Where the loss of continuity of safety-related control circuits depending upon sliding contacts can result in hazardous condition, appropriate measures shall be taken	No such function has been found.	Not applicable
10	Operator interface and machine-mounted control devices		-
10.1	General		-
10.1.1	General device requirements		-
	As far as is practicable, those devices shall be selected, mounted, and identified or coded according to IEC 60073 and IEC 60447		Pass
10.1.2	Location and mounting		-
	Appropriate location mounting for machine-mounted and hand-operated control devices	This requirement has been complied with.	Pass
10.1.3	Protection		-
	Operator and machine mounted control devices shall with stand the stress of expected use.	They can withstand the stress of expected use.	Pass
	The operator interface control devices shall have a min degree of protection: IPXXD		Pass
10.1.4	Position sensors		-
	Position sensors shall not be damaged in the event of over travel	No position sensor has been used.	Not applicable
	Position sensors used in circuits with safety-related functions either shall have positive opening operation or shall provide similar reliability		Not applicable
10.1.5	Portable and pendant control stations		-
	Portable and pendant control stations and their control devices shall be so selected and arranged as to minimize the possibility of inadvertent machine operations caused by shocks and vibrations		Not applicable
10.2	Push-buttons		-

10.2.1	Colors		-
	Push-button actuators shall be color –coded according to table 2	Their colors are according to table 2.	Pass
10.2.2	Markings		-
	Use of adequate markings for push-buttons	Adequate markings are used.	Pass
10.3	Indicator lights and displays		-
10.3.1	Modes of use		-
	Indication and /or confirmation		Pass
10.3.2	Colors		-
	Color-coded according to table 3 (Unless otherwise agree between the supplier and the user)	Their colors are according to table 3.	Pass
10.3.3	Flashing lights		-
	Use of flashing lights		Not applicable
10.4	Illuminated push-buttons		-
	Color-coded according to table2 and 3		Not applicable
10.5	Rotary control devices		-
	Devices having a rotational member shall be mounted to prevent rotation of the stationary member (Friction alone shall not be sufficient)	Inadvertent operation can been prevented.	Pass
10.6	Start devices		-
	Shall be constructed and mounted to minimize inadvertent operation		Pass
10.7	Devices for emergency stop		-
10.7.1	Location		-
	Devices for emergency stop shall be readily accessible	It is readily accessible .	Pass
	Emergency stop devices shall be located at each operator control station and at other locations where the initiation of an emergency stop can be required	All of them are located at each operator control station.	Pass
10.7.2	Types		-
	Use of type - a push-button operated switch - a pull-cord operated switch - a pedal-operated switch without a mechanical guard	A push-button operated switch.	Pass
	Shall be of the self-latching type and shall have positive opening operation	Self-latching type and positive opening operation.	Pass
10.7.3	Restoration of normal function after emergency stop		-
	It shall not be possible to restore an emergency stop circuit until all emergency stop devices have been manually reset.	This requirement has been complied with.	Pass
10.7.4	Local operation of the supply disconnecting device to effect switching off		-
	Where the supply disconnecting device is to be locally operated for emergency switching off, it shall be readily accessible and should meet the colour requirements of 10.7.3		Not applicable
10.8	Emergency switching off devices		-
10.8.1	Location of emergency switching off devices		-

	Emergency switching off devices shall be located as necessary for the given application. Normally, those devices will be located separate from operator control stations. Where it is necessary to provide a control station with an emergency stop device and an emergency switching off device, means shall be provided to avoid confusion between these devices.		Not applicable
10.8.2	Types of emergency switching off device		-
	The types of device for emergency switching off include: - a push-button operated switch with a palm or mushroom head type of actuator; - a pull-cord operated switch.		Not applicable
	The devices shall have direct opening action (see IEC 60947-5-1, Annex K).		Not applicable
	The push-button operated switch may be in a break-glass enclosure.		Not applicable
10.8.3	Colour of actuators		-
	Actuators of emergency switching off devices shall be coloured RED. If a background exists immediately around the actuator, then this background shall be coloured YELLOW.		Not applicable
	Where confusion can occur between emergency stop and emergency switching off devices, means shall be provided to minimize confusion.		Not applicable
10.8.4	Local operation of the supply disconnecting device to effect emergency switching off		-
	Where the supply disconnecting device is to be locally operated for emergency switching off, it shall be readily accessible and should meet the colour requirements of 10.8.3.		Not applicable
10.9	Enabling control device		-
	When an enabling control device is provided as a part of a system, it shall signal the enabling control to allow operation when actuated in one position only. In any other position, operation shall be stopped or prevented		Not applicable
	Enabling control devices shall be selected and arranged so as to minimize the possibility of defeating.		Not applicable
	Enabling control devices shall be selected that have the following features in this clause.		Not applicable
11	Control gear: location, mounting, and enclosures		-
11.1	General requirements		-
11.2	Location and mounting		-
11.2.1	Accessibility and maintenance		-
	All control gears can be identified without moving or the wiring	All of them can be identified without moving or the wiring.	Pass
	Replacement without dismantling other equipment or parts of the machine	They can be replaced without dismantling other equipment or parts of the machine.	Pass
	Terminals not associated with control gear shall also comply with the requirements mentioned above	Those relative requirements have been complied with.	Pass

	Facilitate operation and maintenance from the front.	It can easily operation and maintenance from the front.	Pass
	Use of special tools (if necessary)		Pass
	If access is required for regular maintenance or adjustment, the devices shall be located between 0.4 m and 2.0 m above the severing level	Those relative requirements have been complied with.	Pass
	It is recommended that terminals be at least 0.2m above the servicing level and so placed that connectors and cables can be easily connected to them	Above 0.2m and can be connected easily.	Pass
	Except those for operating, indicating, measuring and cooling, no devices shall be mounted on doors, and normally removable access covers, of enclosures	No electrical devices mounted on doors.	Pass
	If control devices are connected through plug-in arrangements, their association shall be made clear by type (shape), marking or designation, singly or in combination.	No control device is connected through plug-in arrangement.	Not applicable
	Plug in devices shall be provided with non-interchangeable features		Not applicable
	Use of plug/socket combinations shall be unobstructed access		Not applicable
11.2.2	Physical separation or grouping		-
	Non-electrical parts and devices not directly associated with the electrical equipment shall not be located within enclosures containing control gear	No this kind of parts or devices are located within enclosures containing control gear.	Pass
	Devices such as solenoid valves should be separated from the other electrical equipment.	All solenoid valves have been separated from the other electrical equipment.	Pass
	Control devices mounted in the same location and connected to the supply voltage, or to both supply and control voltages, shall be grouped separately from those connected only to the control voltages	Appropriate separation has been taken.	Pass
	Terminals shall be separated into groups for : - power circuits; - associated control circuits - other control circuits, fed from external sources	They have been Separated appropriately.	Pass
	The clearances and creep distances specified for the devices shall be maintained	Appropriately clearances and creep distances have been provided.	Pass
11.2.3	Heating effects		-
	Heat generating components shall be located so that the temperature of each component in the vicinity remains within the permitted limit	Wind cooling equipment has been provided.	Pass
11.3	Degrees of protection		-
	Enclosures of control gear: at least IP 22		Pass
11.4	Enclosures, doors and openings		-

	Enclosure shall be constructed using materials capable of withstanding the mechanical, electrical and thermal stresses	The material (metal plate with painting used for enclosure can withstand the mechanical, electrical and thermal stresses	Pass
	Fasteners used to secure doors and covers should be of the captive type	Captive type.	Pass
	Windows provided for viewing internally mounted indicating devices shall be of a material suitable to withstand mechanical stress and chemical attach.		Not applicable
	It is recommended that enclosures doors shall have: - Not wider than 0.9 m - Vertical hinges - Lift-off type - Angle of opening at least 95°	These requirements have been taken.	Pass
	If enclosures which readily allow a person fully to enter, the relevant requirements specified in this clause shall be comply	No this kind of situation.	Not applicable
	The joints or gaskets of doors, lids, covers and enclosures shall withstand the chemical effects of the aggressive liquids, vapours, or gases used on the machine	They can withstand the chemical effects of the aggressive liquids, vapours, or gases used on the machine.	Pass
	The means used to maintain the degree of protection of an enclosure on doors, lids and covers that require opening or removal for operation or shall be secured	They can be secured firmly.	Pass
	The degree of protection for all openings in the enclosures shall be secured	The degree of protection can be secured.	Pass
	Openings for cable shall be easily re-opened on site	They can be re-opened easily.	Pass
	There shall be no opening between enclosures containing electrical equipment and compartments containing coolant, lubricating or hydraulic fluids, or those into which oil, other liquids, or dust can penetrate	No this kind of opening has been found.	Not applicable
	The requirement mentioned above does not apply to electrical devices specially designed to operate in oil nor to electrical equipment in which coolants are used		Not applicable
	Where there are holes in an enclosure for mounting purpose, the degree of protection for the enclosure shall be secured	Appropriate protection degree can be secured.	Pass
	Equipment that, can attain a surface temperature sufficient to cause a risk of fire or harmful effect to an enclosure material, the relevant requirements shall be complied	No this kind of equipment.	Not applicable
11.5	Access to control gear		-
	The min dimensions of gangways in front of and between control gear shall be according to 481.2.4 of IEC 60364-4-481	No this kind of gangway has been found.	Not applicable

	Doors in gangways and for access to electrical operating areas shall: - be at least 0.7 m wide and 2.0 m high; - open outward; -have a menace to allow opening from the inside without the use of a key or tool	No this kind of gangway has been found.	Not applicable
12	Conductors and cables		-
	General requirements		-
	Conductors and cables shall be selected so as to be suitable for the operating conditions (for example voltage, current, protection against electric hock, grouping of cables) and external influences (for example ambient temperature, presence of water or corrosive substances, mechanical stresses (including stresses during installation), fire hazards) that can exist.	All of conductors and cables used on these machines are suitable for the operating conditions and external influences.	Pass
12.2	Conductors		-
	In general, conductors shall be of copper.		Pass
	Where aluminum conductors are used, the cross sectional area shall be at least 16 mm^2	This requirement has been met.	Pass
	To ensure adequate mechanical strength, the cross-sectional area of conductors should not be less than as shown in Table 5 . However, conductors with smaller cross-sectional areas or other constructions than shown in Table 5 may be used in equipment provided adequate mechanical strength is achieved by other means and proper functioning is not impaired.	All these requirements have been complied with.	Pass
	All conductors that are subject to frequent ovement (for example one movement per hour of machine operation) shall have flexible stranding of class 5 or class 6.	This requirement has been met.	Pass
12.3	Insulation		-
	The insulation of cables and conductors used, shall be suitable for a test voltage: - not less than 2000 V AC for a duration of 5 min for operation at voltages higher than 50 V AC or 120 V DC, or - not less than 500 V AC for a duration of 5 min for PELV circuits (see IEC 60364-4-41, class Ⅲ equipment).	This test has been carried out for the cables, and there is no breakdown is occurred.	Pass
	The mechanical strength and thickness of the insulation shall be such that the insulation cannot be damaged in operation or during laying, especially for cables pulled into ducts.	Appropriate insulation with sufficient mechanical strength and thickness is provided.	Pass
12.4	Current-carrying capacity in normal service		-
	Max allowable temperature of conductors shall not exceed the values given in table 6.	See table6	Pass
12.5	Conductor and cable voltage drop		-
	The voltage drop for conductors and cables shall not exceed 5% of the nominal voltage	Not exceed 5%.	Pass
12.6	Flexible cables		-
12.6.1	General		-
	Flexible cables shall have Class 5 or Class 6 conductors.	This requirement has been met.	Pass

	Cables that are subjected to severe duties shall be of adequate construction	Cables that are subjected to severe duties have adequate construction	Pass
12.6.2	Mechanical rating		-
	The tensile stress for copper conductors shall not exceed 15 N/mm^2 of the copper cross-sectional area	Not exceed 15 N/mm^2	Not applicable
	If the demands of the application exceed the tensile stress, it of 15 N/mm^2, cables with special construction feature should be used and the allowed max. tensile stress strength should be agree with the cable manufacturer	No this kind of Situation.	Not applicable
12.6.3	Current-carrying capacity of cables wound on drums		-
	Cables to be wound on drums shall be selected with conductors having a cross-sectional area such that, when fully wound on the drum and carrying the normal service load, the maximum allowable conductor temperature is not exceeded.	No cable is wound on drums.	Not applicable
	For cables of circular cross-sectional area installed on drums, the maximum current-carrying capacity in free air should be derated in accordance with Table 7 (see also Clause 44 of IEC 60621-3).	No cable is wound on drums.	Not applicable
12.7	Conductor wires, conductor bars and slip-ring assemblies		-
12.7.1	Protection against direct contact		-
	Conductor wires, conductor bars and slip-ring assemblies shall be installed or enclosed in such a way that, during normal access to the machine, protection against direct contact is achieved by the application of one of the following protective measures: - protection by partial insulation of live parts, or where this is not practicable; - protection by enclosures or barriers of at least IP2X (see 412.2 of IEC 60364-4-41).		Not applicable
	Horizontal top surfaces of barriers or enclosures that are readily accessible shall provide a degree of protection of at least IP4X (see 412.2.2 of IEC 60364-4-41).		Not applicable
	Where the required degree of protection is not achieved, protection by placing live parts out of reach in combination with emergency switching off in accordance with 9.2.5.4.3 shall be applied.		Not applicable
	Conductor wires and conductor bars shall be so placed and/or protected as to:		Not applicable
	-prevent contact, especially for unprotected conductor wires and conductor bars, with conductive items such as the cords of pull-cord switches, strain-relief devices and drive chains; -prevent damage from a swinging load.		Not applicable
12.7.2	Protective conductor circuit		-

	Where conductor wires, conductor bars and slip-ring assemblies are installed as part of the protective bonding circuit, they shall not carry current in normal operation. Therefore, the protective conductor (PE) and the neutral conductor (N) shall each use a separate conductor wire, conductor bar or slip-ring. The continuity of the protective conductor circuit using sliding contacts shall be ensured by taking appropriate measures (for example, duplication of the current collector, continuity monitoring).		Not applicable
12.7.3	Protective conductor current collectors		-
	Protective conductor current collectors shall have a shape or construction so that they are not interchangeable with the other current collectors. Such current collectors shall be of the sliding contact type.		Not applicable
12.7.4	Removable current collectors with a disconnector		-
	Removable current collectors having a disconnector function shall be so designed that the protective conductor circuit is interrupted only after the live conductors have been disconnected, and the continuity of the protective conductor circuit is re-established before any live conductor is reconnected (see also 8.2.4).		Not applicable
12.7.5	Clearances in air		-
	Clearances between the respective conductors, and between adjacent systems, of conductor wires, conductor bars, slip-ring assemblies and their current collectors shall be suitable for at least a ated impulse voltage of an overvoltage category Ⅲ in accordance with IEC 60664-1.		Not applicable
12.7.6	Creepage distances		-
	Creepage distances between the respective conductors, between adjacent systems of conductor wires, conductor bars and slip-ring assemblies, and their current collectors shall be suitable for operation in the intended environment, for example open air (IEC 60664-1), inside buildings, protected by enclosures.		Not applicable
	In abnormally dusty, moist or corrosive environments, the following creepage distance requirements apply: -unprotected conductor wires, conductor bars, and slip-ring assemblies shall be equipped with insulators with a minimum creepage distance of 60 mm; -enclosed conductor wires, insulated multipole conductor bars and insulated individual conductor bars shall have a minimum creepage distance of 30 mm.	No such condition exist.	Not applicable
	The manufacturer's recommendations shall be followed regarding special measures to prevent a gradual reduction in the insulation values due to unfavourable ambient conditions (for example deposits of conductive dust, chemical attack).		Not applicable
12.7.7	Conductor system sectioning		-

	Where conductor wires or conductor bars are arranged so that they can be divided into isolated sections, suitable design measures shall be employed to prevent the energization of adjacent sections by the current collectors themselves.		Not applicable
12.7.8	Construction and installation of conductor wire, conductor bar systems and slip-ring assemblies		Not applicable
	Conductor wires, conductor bars and slip-ring assemblies in power circuits shall be grouped separately from those in control circuits.		Not applicable
	Conductor wires, conductor bars and slip-ring assemblies shall be capable of withstanding, without damage, the mechanical forces and thermal effects of short-circuit currents.		Not applicable
	Removable covers for conductor wire and conductor bar systems laid underground or underfloor shall be so designed that they cannot be opened by one person without the aid of a tool.	No such condition exist.	Not applicable
	Where conductor bars are installed in a common metal enclosure, the individual sections of the enclosure shall be bonded together and connected to a protective bonding conductor at several points depending upon their length. Metal covers of conductor bars laid underground or underfloor shall also be bonded together and connected to a protective bonding conductor.	No such condition exist.	Not applicable
	The protective bonding circuit shall include the covers or cover plates of metal enclosures or underfloor ducts. Where metal hinges form a part of the bonding circuit, their continuity shall be verified (see Clause 18).		Not applicable
	Underground and underfloor conductor bar ducts shall have drainage facilities.	No such condition exist.	Not applicable
13	Wiring practices		-
13.1	Connections and routing		-
13.1.1	General requirements		-
	All connections, especially those of the protective bonding circuit, shall be secured against accidental loosening.	All connections can be secured against accidental loosening	Pass
	The means of connection shall be suitable for the cross-sectional areas and nature of the conductors being terminated.	The means of connection is suitable.	Pass
	The connection of two or more conductors to one terminal is permitted only in those cases where the terminal is designed for that purpose. However, only one protective conductor shall be connected to one terminal connecting point.	No terminal has been connected with three or more conductors.	Pass
	Soldered connections shall only be permitted here terminals are provided that are suitable for oldering.	No soldered connection has been taken.	Not applicable
	Terminals on terminal blocks shall be plainly marked or labelled to correspond with markings on the diagrams.	All of them have been marked corresponding to markings on the diagrams.	Pass

	Where an incorrect electrical connection (for example, arising from replacement of devices) can be a source of risk and it is not practicable to reduce the possibility of incorrect connection by design measures, the conductors and/or terminations shall be identified in accordance with 13.2.1		Pass
	The installation of flexible conduits and cables shall be such that liquids shall drain away from the fittings.	Liquids can drain away from the fittings.	Pass
	Means of retaining conductor strands shall be provided when terminating conductors at devices or terminals that are not equipped with this facility. Solder shall not be used for that purpose.	By appropriate terminals.	Pass
	Shielded conductors shall be so terminated as to prevent fraying of strands and to permit easy disconnection.	Appropriate termination is taken.	Pass
	Identification tags shall be legible, permanent, and appropriate for the physical environment.	They are legible, permanent, and appropriate for the physical environment.	Pass
	Terminal blocks shall be mounted and wired so that the internal and external wiring does not cross over the terminals(see IEC 60947-7-1).	No conductor crosses over the terminals.	Pass
13.1.2	Conductor and cable runs		-
	Conductor and cable shall be run from terminal to terminal without splices or joints. Connections using plug/socket combinations with suitable protection against accidental disconnection are not considered to be joints for the purpose of this Sub clause.	All of them are run from terminal to terminal without splices or joints.	Pass
	Where it is necessary to connect and disconnect cables and cable assemblies, a sufficient extra length shall be provided for that purpose.		Pass
	The terminations of cables shall be adequately supported to prevent mechanical stresses at the terminations of the conductors.	Adequate support measure has been taken.	Pass
	Wherever practicable, the protective conductor shall be placed close to the associated live onductors in order to decrease the impedance of the loop.		Pass
13.1.3	Conductors of different circuits		-
	Suitable arrangement for conductors of different circuits	Suitable arrangement is provided.	Pass
13.1.4	Connection between pick-up and pick-up converter of an inductive power supply system		-
	The cable between the pick-up and pick-up converter as specified by the manufacturer of the inductive power supply shall be: -as short as practicable; -adequately protected against mechanical damage.	These requirements have been complied with.	Pass
13.2	Identification of conductors		-
13.2.1	General requirements		-
	Conductors shall be identifiable at each termination according to the technical documentation (see clause 17)	Make reference to clause 18.	Pass
	Use of color-coding for identification of conductors		Pass

	It is recommended (for example to facilitate maintenance) that conductors be identified by number, alphanumeric, colour(either solid or with one or more strips),or a combination of colour and numbers or alphanumeric. When numbers are used, they shall be Arabic; letters shall be Roman (either upper or lower case).	Appropriate measures have been taken to identify conductors.	Pass
13.2.2	Identification of the protective conductor shall be really distinguishable by shape, location, marking or color	By marking and color.	Pass
	When identification is by color alone, the bicolor combination GREEN-AND YELLOW shall be used	By GREEN-AND-YELLOW	Pass
	For the bicolor combination GREEN-AND YELLOW: one of the color covers at least 30% and not more than 70% of the surface of the conductor, the other color covering the remainder of the surface		Pass
	Use of graphical symbol 	The earthing symbol has been used.	Pass
13.2.3	Identification of the neutral conductor		-
	The color shall be Light Blue	No neutral conductor has been used.	Not applicable
	Requirements for bare conductors used as neutral conductors		Not applicable
13.2.4	Identification by colour		-
	Where colour-coding is used for identification of conductors (other than the protective conductor (see 13 .2.2) and the neutral conductor (see 13 .2.3)), the following colours may be used:		-
	BLACK, BROWN, RED, ORANGE, YELLOW, GREEN, BLUE (including LIGHT BLUE), VIOLET, GREY, 'WHITE, PINK, TURQUOISE.	Some colors have been used.	Pass
	It is recommended that, where colour is used for identification, the colour be used throughout the length of the conductor either by the colour of the insulation or by colour markers at regular intervals and at the ends or accessible location.	This requirement has been complied with.	Pass
	For safety reasons, the colour GREEN or the colour YELLOW should not be used where there is a possibility of confusion with the bicolour combination GREEN-AND-YELLOW (see l 3 .2.2).	Neither color GREEN nor the color YELLOW has been used.	Pass
	Where colour-coding is used for identification of conductors, it is recommended that they be colour-coded as follows: - BLACK: AC and DC power circuits; - RED: AC control circuits; - BLUE: DC control circuits; - ORANGE: excepted circuits in accordance with 5.3.5.	These requirements have complied with.	Pass
13.3	Wiring inside enclosures		-
	Panel conductors shall be supported where necessary to keep them in place	Appropriate support is provided.	Pass
	Non-Metallic ducts shall be permitted only when they are made with a flame-retardant insulating material	Some non-metallic ducts are used with a flame-retardant insulating material.	Pass

	Connections to devices mounted on doors or to other movable parts shall be made using flexible conductors according to 12.2 and 12.6.	Connections according to I 2.2 and 12.6..	Pass
	The conductors shall be anchored to the fixed and to the movable part independently of the electrical connection	Adequate anchored measures have been taken.	Pass
	Conductors and cables that do not run in ducts shall be adequately supported	All of them have been supported adequately.	Pass
	Terminal blocks or plug-socket combinations shall be used for control wiring that extends beyond the enclosure	This application has been taken.	Pass
	Power cables and cables of measuring circuits may be directly connected to the terminals of the devices for vvhich the connections were intended.	This application has been taken.	Pass
13.4	Wiring outside enclosures		-
13.4.1	General requirements-		-
	The protection degree shall be ensured when cables or ducts are introduced into the enclosure	The protection degree can be secured .	Pass
13.4.2	External ducts		-
	Shall be enclosed in suitable ducts as described in 13.5 except for suitably protected cables		Not applicable
	Fittings used with ducts or multi-conductor cable shall be suitable for the physical environment		Not applicable
	Flexible conduit or flexible multi-conductor cable shall be used where it is necessary to employ flexible connections to pendant push-button stations		Not applicable
	The weight of the pendant stations shall be supported by means other that the flexible conduit or the flexible multi-conductor cable		Not applicable
	Flexible conduit or flexible multi-conductor cables shall be used for connections involving small or infrequent movements		Not applicable
13.4.3	Connection to moving elements of the machine		-
	Connection to frequently moving parts shall be made using conductors according to 13 .2	No device is connected to moving elements of the machine.	Not applicable
	Flexible cable and flexible conduit shall be so installed as to avoid excess flexing and straining, particulary the fittings		Not applicable
	Cables subject to movement shall be supported in such a way that there is no mechanical strain on the connection points nor any sharp flexing		Not applicable
	If the requirement mentioned above is achieved by using of a loop, it shall have sufficient length to provide for a bending radius of the cable of at least 10 times the diameter of the cable		Not applicable
	Flexible cables of machines shall be protected to minimize the possibility of external damage		Not applicable
	The cable sheath shall be resistant to the normal that wear that can be expected from movement and to the effects of atmospheric contaminants		Not applicable
	If cables subject to movement are close to moving parts, it shall have a space of at least 25 mm between the moving parts and the cables		Not applicable

	Where the distance mentioned above is not practicable, fixed barriers shall be provided between the cables and the moving parts		Not applicable
	The cable handling system shall be so designed that the lateral cable angles do no exceed 5 degree, avoiding torsion in the cable		Not applicable
	Measures shall be taken to ensure that at least two turns of flexible cables always remain on a drum		Not applicable
	Min. permitted bending radii for the forced guiding of flexible cables shall not less than the vales given in table 8		Not applicable
	The strength section between two bends in an S-shaped length or a bend into another plane shall be at least 20 times the diameter of the cable		Not applicable
	Where flexible conduit is adjacent to moving parts, the construction and supporting means shall prevent damage to the flexile conduit .under all conditions of operation		Not applicable
	Flexible metallic conduit shall not be used for rapid of frequent movements		Not applicable
13.4.4	Interconnection of devices on the machine		-
	The connections shall be conveniently placed, adequately protected, and shown on the relevant diagrams		Not applicable
	Such terminals shall be conveniently placed, adequately protected, and shown on the relevant diagrams		Not applicable
13.4.5	Plus/socket combinations		-
	Shall be of adequate size and shall have sufficient contact pressure and a wiping action to ensure electrical continuity		Not applicable
	Clearances between contacts shall be adequate for the voltages used and shall be maintained during insertion and removal of the connectors		Not applicable
	Prevent unintentional contact with live parts at any time		Not applicable
	Protective bonding circuit connection shall be made before any live connections are made, and shall not disconnected until all live connections in the plug are disconnected		Not applicable
	Rated at more than 16 A or that remain connected during normal service shall be of a remaining type to prevent unintended disconnection		Not applicable
	Rated at 63 A or above shall be of an interlocked type with a switch, so that connection and disconnection is possible only when the switch is in the OFF position		Not applicable
	If more than one plug-socket combination is used in the same electrical equipment, they shall be clearly identifiable		Not applicable
	It is recommended that mechanical coding be use to prevent incorrect insertion		Not applicable
	According to IEC 60309-1 or of a type used for domestic application shall not be used for control circuits		Not applicable
13.4.6	Dismantling for shipment		-

	Terminals shall be suitably enclosed and plug/socket combinations shall be protected from the physical environment during transportation and storage	All of them are enclosed suitably.	Pass
13.4.7	Additional conductors		-
	Spare conductors shall be connected to spare terminals or isolated to prevent contact with live parts	All spare conductors are connected to spare terminals or isolated to prevent contact with live parts	Pass
13.5	Ducts, connection boxes and other boxes		-
13.5.1	General requirements		-
	Min. protection degree for ducts: IP 33		Pass
	Appropriate protection for conductors insulation	Suitable protection is taken.	Pass
	Drain holes of 6 mm diameter are permitted		Pass
	Ducts and cables trays shall be rigidly supported and positioned at a sufficient distance from moving parts	Suitable protection is taken. Suitable support and sufficient distance has been taken.	Pass
	In areas where human passage is required, the ducts and cable trays shall be mounted at least 2m above the working surface		Not applicable
	Ducts shall be provided only for mechanical protection	Adequate mechanical protection is provided.	Pass
	Cable trays that are partially covered should not be considered to be ducts or cable trunking system, and the cables used shall be suitable for installation on cable trays	No cable tray is used.	Not applicable
13.5.2	Percentage fill of ducts		-
	The dimensions and arrangement of the ducts be such as to facilitate the insertion of the conductors and cables	This requirement has been complied with.	Pass
13.5.3	Rigid metal conduit and fittings		-
	Shall be of galvanized steel or of a corrosion resistant material	No rigid metal conduit is used.	Not applicable
	Conduits shall be securely held in place and supported at each end		Not applicable
	Fitting shall be threaded		Not applicable
	Where threadless fittings are used, the conduit shall be securely fastened to the equipment		Not applicable
	The conduit shall not be damage and the internal diameter of the conduit shall not effectively reduced when it is bent		Not applicable
13.5.4	Flexible metal conduit and fittings		-
	Flexible metal tubing and suitable for the expected physical environment	No flexible conduit used.	Not applicable
13.5.5	Flexible non-metal conduit and fittings		-
	Shall be resistant to kinking and suitable for the expected physical environment	No flexible non-metal conduit and fittings	Not applicable
13.5.6	Cable trunking systems		-
	Shall be rigidly supported and clear of all moving or contaminating portions of the machine	No cable trunking system is used.	Not applicable
	Covers shall be shaped to overlap the sides; gasket shall be permitted		Not applicable

	Covers shall be attached to cable trunking systems by hinges or chain and held closed by means of captive screws or other suitable fasteners		Not applicable
	On horizontal cable trunking systems, the cover shall not be on the bottom		Not applicable
	Where the cable trunking system is furnished in sections, the joints between sections shall fit tightly but need not be gasketed		Not applicable
	The only openings permitted shall be those required for wiring or for drainage		Not applicable
	Cable trunking systems shall not have opened but unused knockouts		Not applicable
13.5.7	Machines compartments and cable trunking systems		-
	Are isolated from coolant or oil reservoirs and are entirely enclosed		Not applicable
	Conductors run in enclosed compartment and cable trunking systems shall be so secured and arranged that they are not subject to damage		Not applicable
13.5.8	Connection boxes and other boxes		-
	Shall be readily accessible for maintenance	They are readily accessible for maintenance.	Pass
	Shall provide protection against the ingress of solid bodies and liquids	Adequate protection is provided.	Pass
	Shall not have opened but unused knockouts nor any other opening and shall be so constructed as to exclude materials such as dust, flying, oil, and coolant	These requirements have been complied with.	Pass
13.5.9	Motor connection boxes		-
	Shall enclose only connections to the motor and motor-mounted devices	They enclose only connections to the motor and motor-mounted devices.	Pass
14	Electric motors and associated equipment		-
14.1	General requirements		-
	Electric motor should conform to the requirements of IEC 60034-1	The electric motor is in conformity with the requirements of IEC 60034 series.	Pass
14.2	Motor enclosures		-
	Protection degree shall be at least IP 23		Pass
14.3	Motor dimensions		-
	As far as is practicable, the dimensions of the motors shall comply with IEC 60072 series.	It is in compliance with IEC 60072 Series.	Pass
14.4	Motor mounting and compartments		-
	Each motor and its associated couplings, belts and pulleys, or chains, shall be so mounted that they are adequately protected and are easily for inspection	They have adequate protection and are easily for inspection.	Pass
	Shall be such that all motor hold-down means can be removed and all terminal boxes are accessible	This requirement has been complied with.	Pass
	The proper cooling shall be ensured and the temperature rise remains within the limits of the insulation class.	This requirement has been complied with.	Pass

	Motor compartment should be clean and dry, and shall be ventilated directly to the exterior of the machine	No motor compartment is found.	Not applicable
	The vents shall be such that ingress of swarf, dust, or water spray is at an acceptable level	Adequate vents are provided.	Pass
	There shall be no opening between the motor compartment and any other compartment that does not meet the motor compartment requirements	No this kind of opening.	Pass
	If a conduit or pipe is run into the motor compartment from another compartment not meet the motor compartment requirements, any clearance around the conduit or pipe shall be sealed	No this kind of situation.	Not applicable
14.5	Criteria for motor selection		-
	Shall be selected according to the anticipated service and physical environment conditions	They are selected according to the anticipated service and physical environment conditions.	Pass
14.6	Protective devices for mechanical brakes		-
	Operation of the overload and over current protective devices for mechanical brake actuators shall initiate the simultaneous de-energization (release) of the associated machine actuators	No this kind of device .	Not applicable
15	Accessories and lighting		-
15.1	Accessories		-
	Where the machine or its associated equipment is provided with socket-outlets that are intended to be used for accessory equipment (for example hand-held power tools, test equipment), the following apply:		-
	- the socket-outlets should conform to IEC 60309-1 'Where that is not practicable, they should be clearly marked with the voltage and current ratings		Not applicable
	- the continuity of the protective bonding circuit to the socket-outlet shall be ensured except where protection is provided by PELV'		Not applicable
	- all unearthed conductors connected to the socket-outlet shall be protected against overcurrent and, when required, against overload in accordance with 7.2 and 7.3 separately from the protection of other circuits;		Not applicable
	-where the power supply to the socket-outlet is not disconnected by the supply disconnecting device for the machine or the section of the machine, the requirements of 5.3 .5 apply.		Not applicable
15.2	Local lighting of the machine and equipment		-
15.2.1	General		-
	Connections to the protective bonding circuit shall be in accordance with 8.2.2.	It is in accordance with 8.2.2.	Pass
	The ON/OFF switch shall not be incorporated in the lampholder or in the flexible connecting cords.	A switch has provided in the front of the machine.	Pass
	Stroboscopic effects from lights shall be avoided by the selection of appropriate luminaires.		Pass

	Where fixed lighting is provided in an enclosure, electromagnetic compatibility should be taken into account using the principles outlined in 4.4.2.	This requirement has been considered	Pass
15.2.2	Supply		-
	The nominal voltage of the local lighting circuit shall not exceed 250V between conductors. A voltage not exceeding 50V between conductors is recommended.	The voltage of the lighting circuit is 230V	Pass
	Lighting circuits shall be supplied from one of the following sources (see also 7.2.6) in this clause.		Pass
15.2.3	Protection		-
	Local lighting circuits shall be protected in accordance with 7.2.6.	Please see the relative clause.	Pass
15.2.4	Fittings		-
	Adjustable lighting fittings shall be suitable for the physical environment		Pass
	The lampholders shall be : -in accordance with the relevant IEC standard; -constructed with an insulating material protecting the lamp cap so as to prevent unintentional contact	These requirements have been met.	Pass
	Reflectors shall be supported by a bracket and not by the lampholder.		Pass
16	Marking, warning signs and reference designations		-
16.1	General		-
	Warning signs, nameplates, markings, and identification plates shall be of sufficient durability to withstand the physical environment involved.	They can withstand the physical environment involved.	Pass
16.2	Warning signs		-
16.2.1	Electric shock hazard		-
	Enclosures that do not otherwise clearly show that they contain electrical equipment that can give rise to a risk of electric shock shall be marked with the graphical symbol IEC 60417-5036	This warning sign has been used	Pass
16.2.2	Hot surfaces hazard		-
	Where the risk assessment shows the need to warn against the possibility of hazardous surface temperatures of the electrical equipment, the graphical symbol IEC 604 I 7-5041 shall be used.	See the risk assessment report.	Pass
16.3	Functional identification		-
	Control devices, visual indicators, and displays (particularly those related to safety) shall be clearly and durably marked with regard to their functions either on or adjacent to the item. Such markings may be as agreed between the user and the supplier of the equipment (see Annex B).	Appropriate markings have been provided for these devices.	Pass
	Preference should be given to the use of standard symbols given in IEC 60417 and ISO 7000	Preference should be . given to the use of standard symbols given in IEC 60417 and ISO 7000.	Pass
16.4	Marking of equipment		-
	Equipment (for example controlgear assemblies) shall be legibly and durably marked in a way that is plainly visible after the equipment is installed adjacent to each incoming supply:	They have been marked legibly and durably.	Pass

	The full-load current shown on the nameplate shall be not less than the running currents for all motors and other equipment that can be in operation at the same time under normal conditions.	This requirement has been met.	Pass
	Where only a single motor controller is used, that information may instead be provided on the machine nameplate where it is plainly visible.		Pass
16.5	Reference designations		-
	All enclosures, assemblies, control devices, and components shall be plainly identified with the same reference designation as shown in the technical documentation.	These information has been provided within the instruction manual.	Pass
17	Technical documentation		-
17.1	General		-
	The information necessary for installation, operation, and maintenance of the electrical equipment of a machine shall be supplied in the appropriate forms, for example, drawings, diagrams, charts, tables, instructions.	All the information has been provided by many forms.	Pass
	The information shall be in an agreed language (see also Annex B).	In English	Pass
	The information provided may vary with the complexity of the electrical equipment. For very simple equipment, the relevant information may be contained in one document, provided that the document shows all the devices of the electrical equipment and enables the connections to the supply network to be made.		-
17.2	Information to be provided		-
	The information provided with the electrical equipment shall include the requirements specified in this clause.	All of these information has been vided.	Pass
17.3	Requirements applicable to all documentation		-
	Unless otherwise agreed between manufacturer and user:		-
	- the documentation shall be in accordance with relevant parts of IEC 61082;	This requirement has been met.	Pass
	- reference designations shall be in accordance with relevant parts of IEC 61346;	This requirement has been met.	Pass
	- instructions/manuals shall be in accordance with IEC 62079.	This requirement has been met.	Pass
	- parts lists where provided shall be in accordance with IEC 62027, class B.	This requirement has been met.	Pass
	For referencing of the different documents, the supplier shall select one of the following methods:		-
	- where the documentation consists of a small number of documents (for example less than 5) each of the documents shall carry as a cross-reference the document numbers of all other documents belonging to the electrical equipment; or	No this condition exist.	Not applicable
	- for single level main documents only (see IEC 62023), all documents shall be listed with document numbers and titles in a drawing or document list; or		Not applicable

	- all documents of a certain level (see IEC 62023) of the document structure shall be listed, with document numbers and titles, in a parts list belonging to the same level.		Not applicable
17.4	Installation documents		-
	Use and requirements for installation diagram	Installation diagrams are provided.	Pass
17.5	Overview diagrams and function diagrams		-
	Use and requirements for Overview diagrams and function (block) diagram	Overview diagrams are provided.	Pass
17.6	Circuit diagrams		-
	Use and requirements for circuit diagrams	Circuit diagrams are provided.	Pass
17.7	Operating manual		-
	The technical documentation shall contain an operating manual detailing proper procedures for set-up and use of the electrical equipment	Operating manual is provided.	Pass
	Particular attention should be given to the safety measures provided		Pass
	Where the operation of the equipment can be programmed, detailed information on methods of programming, equipment required, program verification, and additional safety procedures (where required) shall be provided		Not applicable
17.8	Maintenance manual		-
	The technical documentation shall contain a maintenance manual detailing proper procedures for adjustment, servicing and preventive inspection, and repair. Recommendations on maintenance/service intervals and records should be part of that manual. 'Where methods for the verification of proper operation are provided (for example software testing programs), the use of those methods shall be detailed.	Maintenance manual is provided	Pass
17.9	Parts list		-
	The parts list, where provided, shall comprise, as a minimum, information necessary for ordering spare or replacement parts (for example components, devices, software, test equipment, technical documentation) required for preventive or corrective maintenance including those that are recommended to be carried in stock by the user of the equipment	Parts list is provided.	Pass
18	Verification		-
18.1	General		-
	This part of EN 60204 gives general requirements for the electrical equipment of machines.		-
	The extent of verification will be given in the dedicated product standard for a particular machine. Where there is no dedicated product standard for the machine, the verifications shall always include the items a), b) and f)and may include one or more of the items c) to e) in this clause.	Relative tests have been carried out according to this clause.	Pass
	When the electrical equipment is modified, the requirements stated in 18.7 shall apply.		Pass

	For tests in accordance with 18.2 and 18.3, measuring equipment in accordance with the EN 61557 series is applicable.	Measuring equipment in accordance with the EN 61557 series is applicable.	Pass
	The results of the verification shall be documented.	The result has been documented	Pass
18.2	Verification of conditions for protection by automatic disconnection of supply		-
18.2.1	General		-
	The conditions for automatic disconnection of supply (see 6.3 .3) shall be verified by tests.	Please see the following clause	Pass
	For TN-systems, those test methods are described in 18.2.2; their applications for different conditions of supply are specified in 18.2.3.	Please see the relative clauses.	Pass
	For TT and IT systems, see IEC 60364-6-61		Not applicable
18.2.2	Test methods in TN-systems		-
	Test 1 verifies the continuity of the protective bonding circuit. Test 2 verifies the conditions for protection by automatic disconnection of the supply		-
	Test 1- Verification of the continuity of the protective bonding circuit		-
	The resistance of each protective bonding circuit between the PE terminal (see 5.2 and Figure 2) and relevant points that are part of each protective bonding circuit shall be measured with a current between at least 0.2A and approximately 10A derived from an electrically separated supply source (for example SELV see 413.1 of IEC 60364-4-41) having a maximum no-load voltage of 24V AC or DC.	Please see the test I report	Pass
	Test 2 - Fault loop impedance verification and suitability of the associated overcurrent protective device		-
	The connections of the power supply and of the incoming external protective conductor to the PE terminal of the machine, shall be verified by inspection	They have been verified by inspection	Pass
	The conditions for the protection by automatic disconnection of supply in accordance with 6.3 .3 and Annex A shall be verified by both:		-
1)	verification o f the fault loop impedance by: - calculation, or - measurement in accordance with A.4, and	Please see the test report.	Pass
2)	confirmation that the setting and character risk is of the associated over current protective device are in accordance with the requirements of Annex A.		Pass
18.2.3	Application of the test methods for TN-systems		-
	Test 1 of 18.2.2 shall be carried out on each protective bonding circuit of a machine.	Each protective bonding circuit have been tested	Pass
	When Test 2 of 18.2.2 is carried out by measurement, it shall always be preceded by Test 1		Pass
18.3	Insulation resistance tests		-
	Test conditions: 500 V d.c.		Pass
	The measured values shall not less than 1M Ohm	Please see the test report in detail.	Pass

18.4	Voltage tests		-
	Test conditions ' - at least 1 second - test voltage is twice the raged supply voltage of the equipment or 1000 V, whichever is greater - frequency of 50/60 Hz - supplied from a transformer with a min. rating of 500 VA		Pass
	Shall not breakdown	Please see the test report in detail.	Pass
18.5	Protection against residual voltages		-
	Where appropriate, tests shall be performed to ensure compliance with 6.2.4.		Not applicable
18.6	Functional tests		-

	The functions of electrical equipment shall be tested.	The functions of electrical equipment equipped with this machine have been tested.	Pass
	The function of circuits for electrical safety (for example earth fault detection) shall be tested.	The functions of electrical safety equipped with this machine have been tested	Pass
18.7	Retesting		-
	Where a portion of the machine and its associated equipment is changed or modified, that portion shall be reverificated and retested, as appropriate (see 18. 1).		Not applicable

3. 3 Earthing continuity /Insulation resistance/ Withstand voltage/ Functional test report

Sample specifications			
Rated voltage	6V	Rated frequency	--

Rated output	--	Weight	1.2kg
Test specification	**EN 60204-1: 2006 +AC :2010**		
Test by	Kelly Tang		

Test item	**Continuity of protective bonding circuit**	
Clause of standard	Clause 18.2	
Test requirements	The resistance of each protective bonding circuit between the PE terminal and relevant points that are part of each protective bonding circuit shall be measured with a current between at least 0.2 A and approximately 10 A derived from an electrically separated supply source (for example SELV, see having a maximum no-load voltage of 29.4 V AC or DC. The resistance measured shall be in the expected range according to the length, the cross sectional area and the material of the related protective bonding conductor(s).	
Points tested to :	Test requirement	Measured value
1:Elec.cabinet-PE	≤1.0V	0.34V
2:machine.frame-PE	≤1.0V	0.34V
3:M1-PE	≤1.0V	0.34V
Conclusion	Pass	

Test item	**Fault loop impedance verification and suitability of the associated over current protective device.**
Clause of standard	Clause 18.2
Test requirements	The connections of the power supply and of the incoming external protective conductor to the PE terminal of the machine, shall be verified by inspection.
Conclusion	Pass

Test item	**Insulation resistance test**	Clause of standard	Clause 18.3
Test requirement	The insulation resistance measured at 500V dc between the power circuit conductors and the protective bonding circuit is to be not less		

	than the limits.		
Points tested	Limit value/Resistance(Ω)	Measured value (Ω)	Test result
1:L/N-PE	≥1MΩ	4.8×10^{6}	Pass
2:M1-PE	≥1MΩ	2.7×10^{7}	Pass
Conclusion	Pass		
Test Item	**Electric strength test**	Clause of standard	Clause 18.4
Test requirements	The electrical equipment shall withstand a test voltage applied for a period of at least one second between the conductors of all circuits and the protective bonding circuit		
Points tested	Voltage		Test result
1:L/N-PE	1000V		Pass
2:M1-PE	1000V		Pass
Conclusion	Pass		

Test Item	**Functional test**	Clause of standard	Clause 18.6
Test requirements	The function of electrical equipment shall be tested, particularly those related to safety and safeguarding.		
Points tested	Requirements		Test result
1: Each Emergency button	Function is verified in accordance with the requirements, no unexpected start		Pass
2: Function of button	Function is verified in accordance with the requirements		Pass
Conclusion	Pass		

Equipment used for the measurement

Equipment No.	Name	Mode	Specification		Last time Calibrate	Next time Calibrate	Manufacturers
DL060	Earthing continuity test	CC2520A	0-50A 20-600mΩ		Feb.10.2021	Feb.09.2022	NANJING CHUANGCHUANG TECHNOLOGY CO., LTD.
DL003	Insulation Resistance Meter tester	RK2681A	0-1000V 0-10TΩ		Feb.10.2021	Feb.09.2022	SHENZHEN MEIRUIKE ELECTRONIC TECHNOLOGY CO., LTD
DL001	Withstand voltage tester	RK2671C	AC/DC 0-10KV AC:0-2/20/100mA DC:0-2/20mA		Feb.10.2021	Feb.09.2022	SHENZHEN MEIRUIKE ELECTRONIC TECHNOLOGY CO., LTD

3.4 Noise test report

According to the EC Machinery Directive 2006/42/EC

related to the

OTTOVAC

Model:

OTTOVac-V1 (OV-V1)

Presented by

Nemo Power Tools(Huizhou) Co., Ltd.

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Ⅰ: Introduction

In general this test report for the **OTTOVAC** made by **Nemo Power Tools(Huizhou) Co., Ltd.** carried out in accordance with the clause 1.7.4 of Machinery Directive and some relative requirements described as following.

1.1 Normative references

Emission sound power levels are measured in accordance with 85 EN ISO 11202:2009.
Sound power levels are measured in accordance with the enveloping surface measuring method shown in EN ISO 3746: 2009.

1.2 Types of Noise Level

The international standard mentioned above is applicable to the noise source 0f any type & size except for the machinery with very tall and/or very long size. It is found appropriate for this machinery to use this standard during the testing of noise level.

1.3 Test environment

The testing was carried out to the machine located inside factory with the appropriate control of background noise.

1.4 The machine features

The machines to be measured have the following features:

Sample specifications			
Rated voltage	6V	Rated frequency	--
Rated output	--	Weight	1.2kg
Dimension(mm)	--		
Test by	Kelly Tang		

Ⅱ: Test Instructions

Equipment No.	Equipment's name	Model	specification	Last time calibrate	Next time calibrate	manufacturer
DL118	Sound level meter	AWA56200	30~130Db 20~12.5kH A,C,Z Weighing	Feb.10.2021	Feb.09.2022	Hangzhou Aihua Equipment CO., LTD

Ⅲ: Microphone Positions & Machinery Conditions

3.1 Microphone Positions

When measuring the sound power level the microphone position is set up according to EN ISO 3746:2009, The position on the top of machine is omitted to keep the inspector from dangerous situation. Such a procedure is acceptable by the ISO/TC 43 technical committee.

When measuring the sound emission level the microphone position is set up according to BS EN ISO1120-2009.

3.2 Machinery Conditions

The new machine with features described above has been provided for the test.

Ⅳ:Test Results

Noise Test Report

According to	**EN ISO 3746: 2009, BS EN ISO11202:2009**		
Tested by	**Kelly Tang**		
Ambient temperature	**23.2**℃	Humidity	**54%**
The measurement distance d		**1m**	

Sound Power Level Test Report

Testing condition		**Running**	
Position 1	60.7 dB	Position 3	61.2 dB
Position 1	63.2 dB	Position 4	62.7 dB
Position 1	64.3 dB	Position 5	65.8 dB
Position 1	63.5 dB	Position 6	61.2 dB
Average 1 to 4	64.9 dB	Average 1 to 8	68.6 dB
Background noise		55.2 dB	
Corrections for background noise		0 dB	
The environment correction		5.4 dB	
Sound pressure level		63.5 dB	
Sound power level		65 dB	

A.1 Declaration of conformity with signature

EC Declaration of Conformity	CE

The undersigned, representing the following:

Manufacturerand Company name: Nemo Power Tools(Huizhou) Co., Ltd.	The authorised representative established within the European Economic Area:
ADD: 2/F, 4th Industrial Area, Luokeng Village, Xiaotie Zone, Xiaojinkou Town, Huicheng District, Huizhou City, Guangdong Province, China	

Here with declare that the following machinery:

Description of machinery
Generic denomination: OTTOVAC
Model/s: OTTOVAC-V1(OV-V1)

Fulfill the relevant provisions of European Directive 2006/42/EC(MD)and 2014/35/EU(LVD).

The harmonized standards used in order to obtain compliance to 2006/42/EC(MD) and 2014/35/EU(LVD) are the following:

EN ISO 12100:2010/safety of machinery-General principles for design-Risk assessment and risk Reduction

EN ISO 13857:2008 safety of machinery- Safety distances to prevent hazard zones being reached by upper and lower limbs

EN ISO 13850:2015 safety of machinery-Emergency stop-Principles for design

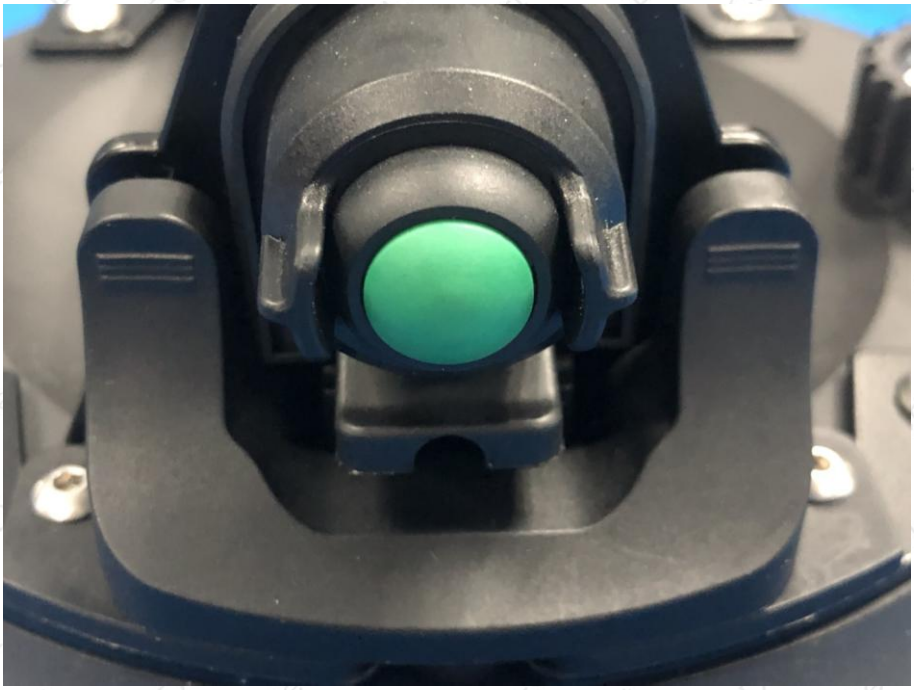
EN ISO 14120:2015 safety of machinery-Guards-General requirements for the design and construction of fixed and movable guards

EN ISO 13849-1:2015 safety of machinery-Safety-related parts of control systems-part 1: General Principles for design

EN ISO 14119:2013 safety of machinery-interlocking devices associated with guards-principles for design and selection

EN 60204-1: 2018/Safety of machinery-Electrical requirements of machines-part 1: General requirements industrial electrical device.

A.2 Photo of machine




-0.6
-0.4
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-10
-8
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-12
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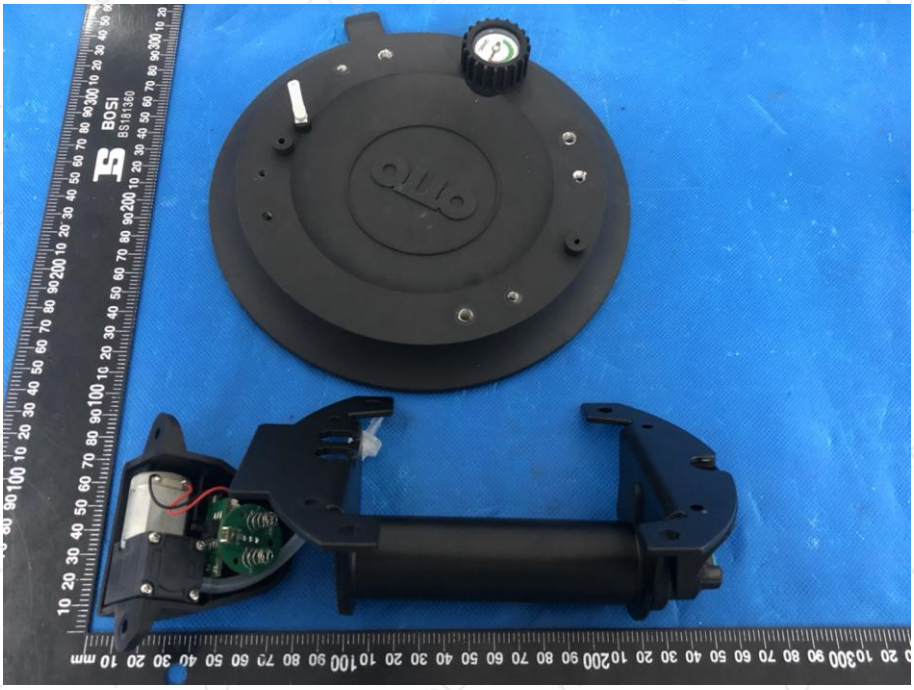
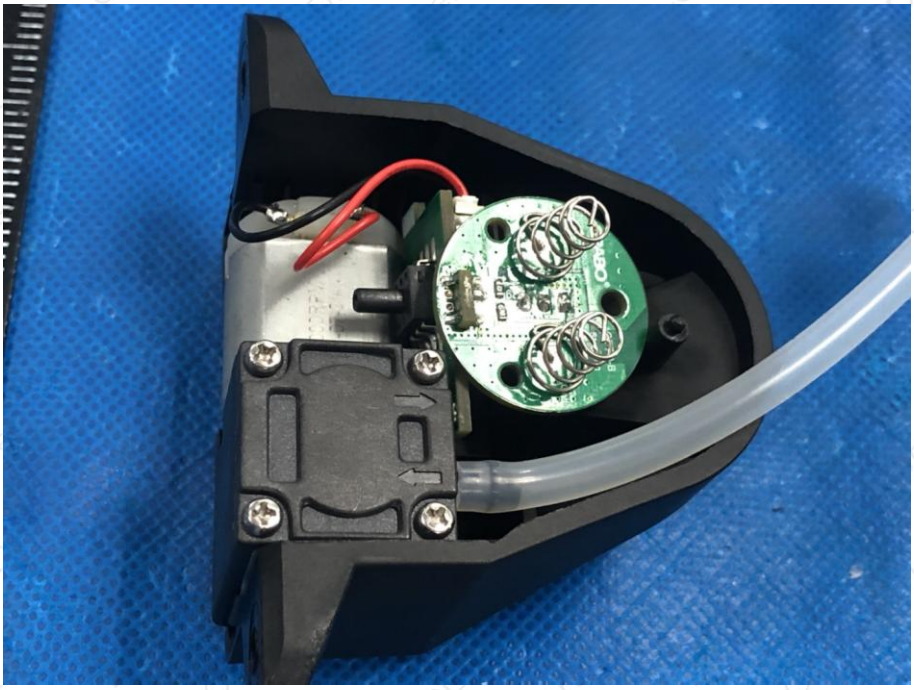
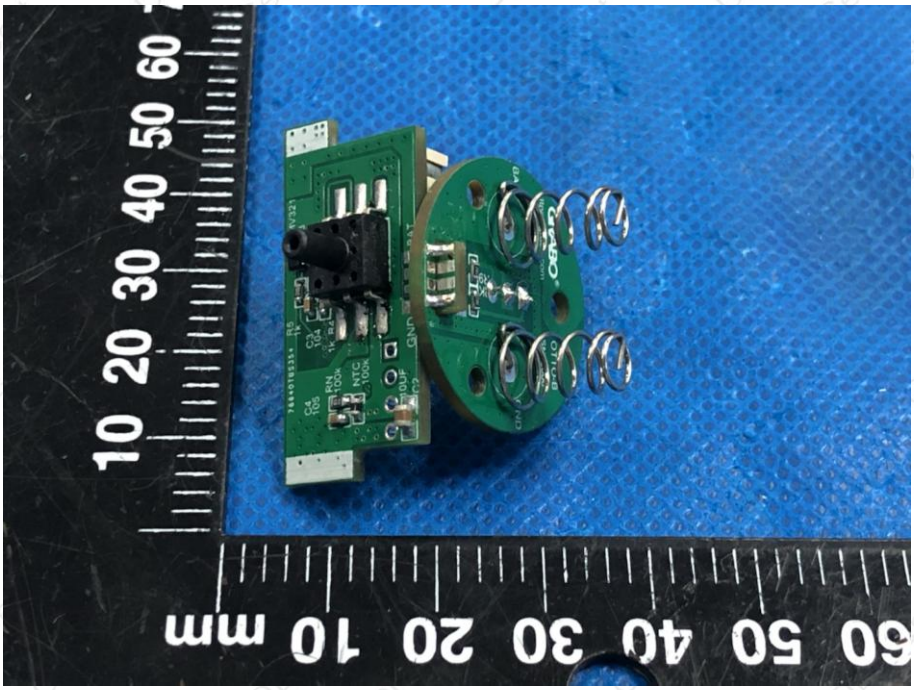
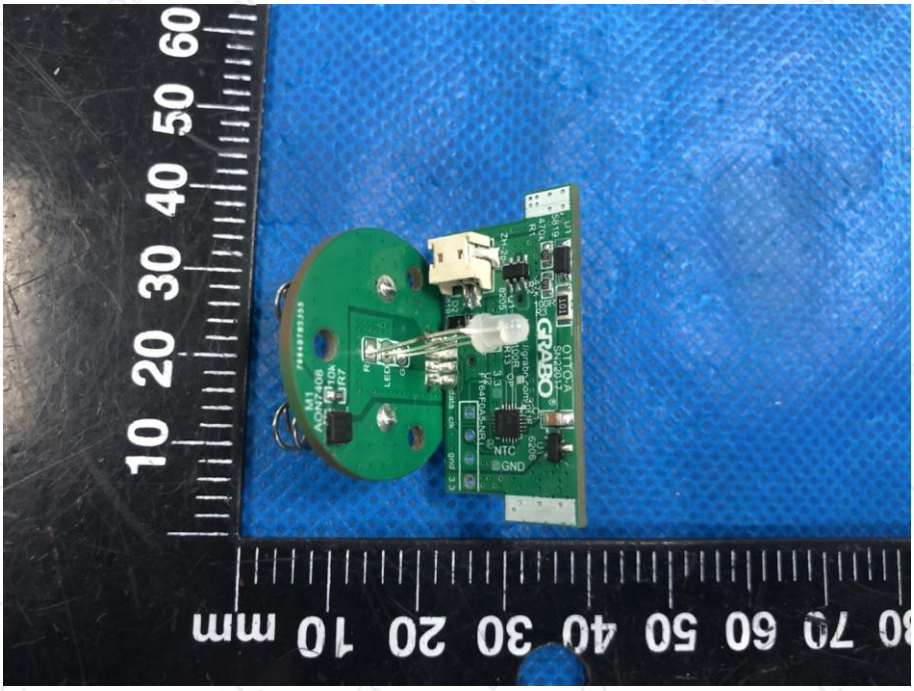
-2
0
psi
bar
GRABO

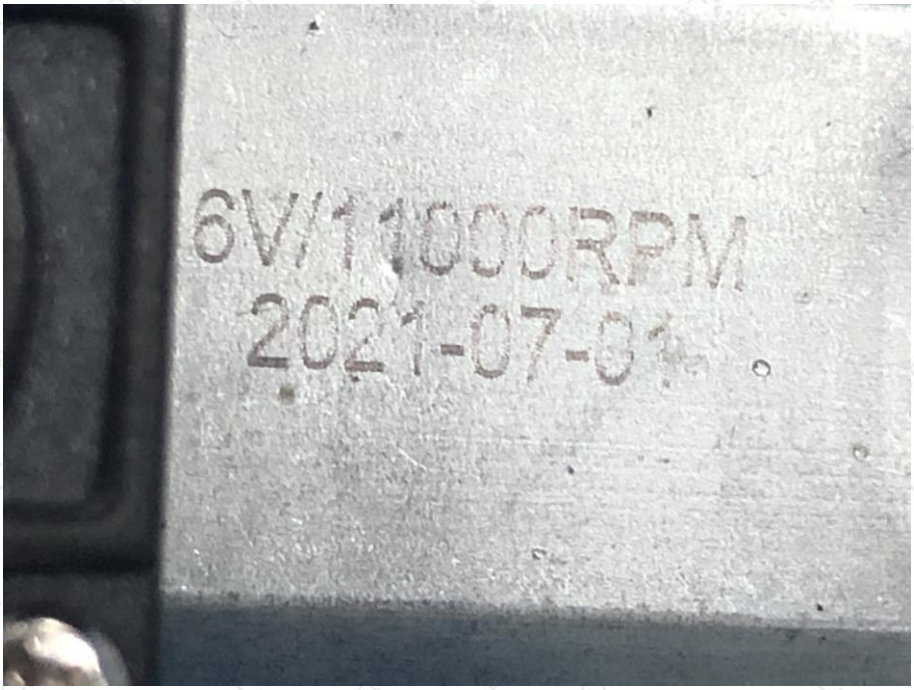

BOSI
BS181360








微型直流真空泵
型号：Z2806-706-10000
流量：4 L/min
负压：70 kpa
电压：DC6V 功率：6W
2021年10月27日


6V/11000RPM
2021-07-01

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